

PAPERWORK REDUCTION ACT SUBMISSION

Please read the instructions before completing this form. For additional forms or assistance in completing this form, contact your agency's Paperwork Clearance Officer. Send two copies of this form, the collection instrument to be reviewed, the supporting statement, and any additional documentation to: Office of Information and Regulatory Affairs, Office of Management and Budget, Docket Library, Room 10102, 725 17th Street NW, Washington, DC 20503.

1. Agency/Subagency originating request	2. OMB control number b. <input type="checkbox"/> None a. _____ - _____
3. Type of information collection (<i>check one</i>) a. <input type="checkbox"/> New Collection b. <input type="checkbox"/> Revision of a currently approved collection c. <input type="checkbox"/> Extension of a currently approved collection d. <input type="checkbox"/> Reinstatement, without change, of a previously approved collection for which approval has expired e. <input type="checkbox"/> Reinstatement, with change, of a previously approved collection for which approval has expired f. <input type="checkbox"/> Existing collection in use without an OMB control number For b-f, note Item A2 of Supporting Statement instructions	4. Type of review requested (<i>check one</i>) a. <input type="checkbox"/> Regular submission b. <input type="checkbox"/> Emergency - Approval requested by _____ / _____ / _____ c. <input type="checkbox"/> Delegated 5. Small entities Will this information collection have a significant economic impact on a substantial number of small entities? <input type="checkbox"/> Yes <input type="checkbox"/> No 6. Requested expiration date a. <input type="checkbox"/> Three years from approval date b. <input type="checkbox"/> Other Specify: _____ / _____
7. Title	
8. Agency form number(s) (<i>if applicable</i>)	
9. Keywords	
10. Abstract	
11. Affected public (<i>Mark primary with "P" and all others that apply with "x"</i>) a. <input type="checkbox"/> Individuals or households d. <input type="checkbox"/> Farms b. <input type="checkbox"/> Business or other for-profit e. <input type="checkbox"/> Federal Government c. <input type="checkbox"/> Not-for-profit institutions f. <input type="checkbox"/> State, Local or Tribal Government	12. Obligation to respond (<i>check one</i>) a. <input type="checkbox"/> Voluntary b. <input type="checkbox"/> Required to obtain or retain benefits c. <input type="checkbox"/> Mandatory
13. Annual recordkeeping and reporting burden a. Number of respondents _____ b. Total annual responses _____ 1. Percentage of these responses collected electronically _____ % c. Total annual hours requested _____ d. Current OMB inventory _____ e. Difference _____ f. Explanation of difference 1. Program change _____ 2. Adjustment _____	14. Annual reporting and recordkeeping cost burden (<i>in thousands of dollars</i>) a. Total annualized capital/startup costs _____ b. Total annual costs (O&M) _____ c. Total annualized cost requested _____ d. Current OMB inventory _____ e. Difference _____ f. Explanation of difference 1. Program change _____ 2. Adjustment _____
15. Purpose of information collection (<i>Mark primary with "P" and all others that apply with "X"</i>) a. <input type="checkbox"/> Application for benefits e. <input type="checkbox"/> Program planning or management b. <input type="checkbox"/> Program evaluation f. <input type="checkbox"/> Research c. <input type="checkbox"/> General purpose statistics g. <input type="checkbox"/> Regulatory or compliance d. <input type="checkbox"/> Audit	16. Frequency of recordkeeping or reporting (<i>check all that apply</i>) a. <input type="checkbox"/> Recordkeeping b. <input type="checkbox"/> Third party disclosure c. <input type="checkbox"/> Reporting 1. <input type="checkbox"/> On occasion 2. <input type="checkbox"/> Weekly 3. <input type="checkbox"/> Monthly 4. <input type="checkbox"/> Quarterly 5. <input type="checkbox"/> Semi-annually 6. <input type="checkbox"/> Annually 7. <input type="checkbox"/> Biennially 8. <input type="checkbox"/> Other (describe) _____
17. Statistical methods Does this information collection employ statistical methods <input type="checkbox"/> Yes <input type="checkbox"/> No	18. Agency Contact (person who can best answer questions regarding the content of this submission) Name: _____ Phone: _____

19. Certification for Paperwork Reduction Act Submissions

On behalf of this Federal Agency, I certify that the collection of information encompassed by this request complies with 5 CFR 1320.9

NOTE: The text of 5 CFR 1320.9, and the related provisions of 5 CFR 1320.8(b)(3), appear at the end of the instructions. *The certification is to be made with reference to those regulatory provisions as set forth in the instructions.*

The following is a summary of the topics, regarding the proposed collection of information, that the certification covers:

- (a) It is necessary for the proper performance of agency functions;
- (b) It avoids unnecessary duplication;
- (c) It reduces burden on small entities;
- (d) It used plain, coherent, and unambiguous terminology that is understandable to respondents;
- (e) Its implementation will be consistent and compatible with current reporting and recordkeeping practices;
- (f) It indicates the retention period for recordkeeping requirements;
- (g) It informs respondents of the information called for under 5 CFR 1320.8(b)(3):
 - (i) Why the information is being collected;
 - (ii) Use of information;
 - (iii) Burden estimate;
 - (iv) Nature of response (voluntary, required for a benefit, mandatory);
 - (v) Nature and extent of confidentiality; and
 - (vi) Need to display currently valid OMB control number;
- (h) It was developed by an office that has planned and allocated resources for the efficient and effective management and use of the information to be collected (see note in Item 19 of instructions);
- (i) It uses effective and efficient statistical survey methodology; and
- (j) It makes appropriate use of information technology.

If you are unable to certify compliance with any of the provisions, identify the item below and explain the reason in Item 18 of the Supporting Statement.

Signature of Senior Official or designee

Date

Agency Certification (signature of Assistant Administrator, Deputy Assistant Administrator, Line Office Chief Information Officer, head of MB staff for L.O.s, or of the Director of a Program or StaffOffice)	
Signature	Date
Signature of NOAA Clearance Officer	
Signature	Date

**SUPPORTING STATEMENT
GULF OF MEXICO OFFSHORE COMMERCIAL SHRIMP FISHERY
ECONOMIC & DEMOGRAPHICS SURVEY
OMB CONTROL NO. 0648-0476**

Introduction

The following is the supporting statement for the Paperwork Reduction Act submission for the approval to collect economic data from Gulf of Mexico commercial shrimp fishing enterprises based in Texas, Louisiana, Mississippi, Alabama, and Florida. The proposed data gathering will be an annual and continuous data collection program.

During the first year only, for Louisiana, Mississippi, Alabama, and Florida, this survey is requesting data for two years, 2000 and 2002. This is to allow these data collected to be directly comparable to those collected from shrimp fishermen in Texas during the pilot survey. The latter year (2002) is the most recent year which we can request information, and anecdotal information suggests that 2002 was likely one of the worst years for this fishery economically, and this survey will provide the data to verify whether this was the case. Conversely, the year 2000 was one of the best years during the last decade in terms of economic performance. Production levels were high and prices maintained their levels, even with higher production. Thus, comparing data from these two years will help to determine which factors have been most influential in causing erosion in profitability. In the future, annual assessments are needed to account for such impacts, and the causes and sources of overall trends in cost and revenue data. In subsequent years, only the most recent completed year for information will be requested.

A. Justification

1. Explain why you need to conduct the information collection.

A collection of economic and social information from fishermen and fishing businesses affected by the management of federal commercial fisheries on the Gulf coast is needed to ensure that national goals, objectives, and requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MFCMA), National Environmental Policy Act (NEPA), Regulatory Flexibility Act (RFA) and Executive Order 12866 (EO 12866) are met. This information is vital in assessing the economic and social effects of fishery management decisions and regulations on individual fishing enterprises, fishing communities, and the nation as a whole.

Social and economic information on commercial fishing enterprises is vital to the Optimum Yield (OY) management of marine fishery resources as mandated under the MFCMA (16 U.S.C. 1802 M-S Act § 3). The term "Optimum" is defined under section 104-297 (28) of the Act, as: (A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factors; and (C) in the case of an over-fished fishery, provides for the rebuilding to a level consistent with producing the maximum sustainable yield in such a fishery.

The overall goal of this project is to collect up-to-date cost, revenue, and social data for this significant fishery. National Standard Guidelines for social and economic information needs are mandated in 50 CFR 600. Additionally, recent legal decisions ruled against DOC, NOAA, NMFS based on the lack of social and economic information or the inadequate analysis of existing data. Thus, it is imperative that these data be collected to accurately assess the economic and social impacts on individual shrimp fishing entities as imposed by shrimp fishery management plans and regulations. Most important, the fishing industry has been calling for the inclusion of social and economic data in the formation of fishery management plans.

It is intended that after the survey has been conducted at least once in each of the Gulf states, a review of the success of the survey document will be conducted, any recommended changes or modifications will be made, and the data collection effort will evolve into an on-going annual survey effort. Regular surveying is necessary to capture critical cost and revenue data that fluctuate from year to year. Fluctuations are generally due to annual fluctuations in shrimp abundance caused by environmental factors. Additionally, markets for Gulf shrimp are exhibiting fluctuations as farm-raised and imported shrimp (both wild caught and farm-raised) are becoming more readily available at lower prices.

This study will be conducted by contract under the auspices of the Economic Fishery Statistics section of the Southeast Regional Office of the NOAA Fisheries. The pilot project was contracted to MRAG Americas, Inc. and initiated on September 30, 2002.

The NOAA Fisheries currently collects limited information from commercial vessels pertaining to their fishing activities, trip dates, landings, and other information through port agents and mandatory dealer reports. There are no substantial social or economic data collected in these systems other than the value of landings, which is neither consistently complete, nor detailed at the individual vessel level. The information is not comprehensive enough for full economic and social analysis.

2. Explain how, by whom, how frequently, and for what purpose the information will be used. If the information collected will be disseminated to the public or used to support information that will be disseminated to the public, then explain how the collection complies with all applicable Information Quality Guidelines.

Social and economic data will be collected from shrimp vessel owners who operate offshore and have primarily landed their catch in one of the five Gulf of Mexico states: Texas, Louisiana, Mississippi, Alabama, and Florida. A pilot study for this effort is currently (in 2003) underway in Texas and is being conducted by a NOAA Fisheries contractor using initial face-to-face interviews of vessel owners (or their designee) who are randomly chosen to participate. This pilot study is forming the model for the survey that will be conducted region-wide.

Since the survey will have been conducted in Texas in 2003, during the first year of this new surveying period (in 2004), the effort will only be conducted in Louisiana, Mississippi, Alabama and Florida. In all subsequent years (2005 onwards), the survey will be conducted in all five Gulf states simultaneously.

The information collected during this study will be used by NOAA Fisheries economists and social scientists to evaluate and modify future ongoing social and economic surveys. The analysis of the sources of variation in costs and revenue during this study will allow future social and economic surveys to be more efficient based on improved stratification and survey designs. Additionally, this first year study will provide an in-depth assessment of the study instrument and interview process.

These data will play an integral role in the social and economic analyses needed for determining the significance of economic impacts on small entities, as required by the Regulatory Flexibility Act and to determine how best to achieve the maximization of net benefits to society, as required by E.O. 12866.

Statistical models that predict or forecast various characteristics such as fleet size, fishing activity or effort, cost versus benefits of fishing, market activity, and efficiencies of proposed fishing regulations will be just a few of the benefits and uses of these data.

Gross revenues and costs can vary within a year, and even within or across seasons/trips, as a result of changes in a number of different factors, including fishery management regulations (e.g. gear modifications, time/area closures, etc.), fluctuations in abundance (due to changes in various environmental factors), and market conditions (such as fuel or seafood prices). Since the last socioeconomic survey was conducted in 1992, there have been great changes in the shrimp fishery with respect to regulations, primary ports of operation, and gear construction, among other factors, yet the social and economic impact of these changes has not been directly assessed. As described in the introduction, during the first year only, this survey is requesting data for two years, 2000 and 2002 for Louisiana, Mississippi, Alabama, and Florida. This is to allow these data collected to be directly comparable to those collected from shrimp fishermen in Texas during the pilot survey. Additionally, anecdotal information suggests that 2002 was likely one of the worst years for this fishery economically, and this survey will provide the data to verify whether this was the case. Some of the potential causes for the downturn have been attributed to prices falling; increases in insurance premiums following September 11, 2001; and rising fuel costs. Conversely, the year 2000 was one of the best years during the last decade in terms of economic performance. Production levels were high and prices maintained their levels, even with higher production. Thus, comparing data from these two years during the first year will help to determine which factors have been most influential in causing erosion in profitability. In subsequent years, only the most recent completed year for information will be requested.

It is anticipated that the information collected by this survey will be disseminated to the public (such as through an annual economic report) or used to support publicly disseminated information. Data may be reported for various groups of fishermen (by vessel size, port, etc.) which will allow vessel owners to compare and evaluate their operations relative to others in the same group in terms of ability to generate revenues, cost efficiency, and profitability.

As will be explained in greater detail in the following paragraphs, the information gathered has utility. NOAA Fisheries will retain control over the information and safeguard it from improper access, modification, and destruction, consistent with NOAA standards for confidentiality, privacy, and electronic information. All data that are submitted are treated as confidential in accordance with NOAA Administrative Order 216-100 and the Magnuson-Stevens Act (16 U.S.C. 1881a, M-S Act § 402(b), Confidentiality of Information). This information collection is designed to yield data that meet all applicable information quality guidelines. Prior to dissemination, the information will be

subjected to quality control measures and a pre-dissemination review pursuant to Section 515 of Public Law 106-554.

The following is a detailed description of justifications for the collection of these data. Section and question numbers refer to the study instrument.

Justifications for Socioeconomic Survey Questions

The Contractor will provide a copy of the survey instrument to each potential respondent in advance of the interview. This will allow respondents to compile the necessary information, thereby minimizing bias due to recall error. It is expected to also increase the efficiency of the interview process with respect to administrative time and costs.

Contact Document

A 'Contact Document' was developed to log all contact or attempts at contact by each individual involved in conducting the surveying. It identifies the person to be interviewed as the vessel owner, or his/her designee; corrects any necessary contact information in case there is a need to follow up with respondents; logs the time and date of all contact including the interview time and date; and provides space for any additional comments the vessel owner/designee may wish to share with the Contractor or NOAA Fisheries.

SECTION I. Fishing Operations and Costs

In general, this section of the survey instrument asks questions pertaining to the annual total of variable costs, fixed costs, other annual costs, capital investment in the vessel & equipment, business arrangements such as ownership and crew shares, and other production factors. Data resulting from Section I questions are generally necessary to generate cost, profit, input demand, and production functions. Such functions and the results generated from their estimation are typically used in financial analyses (used to determine a business' cost efficiency and profitability), economic impact analyses (used to determine the economic value of a particular activity to a particular locale, community, or region), bioeconomic models (used to predict how the biological and economic components of a fishery will respond to exogenous shocks, such as policy changes), cost-benefit analyses (used, in part, to determine the net economic benefits of a particular action), and behavioral models (such as those that explain or predict exit or entry decisions and decisions regarding spatial or temporal allocation of effort). These data can also be used to determine the relative efficiency of the various participating vessels in a fishery and thus whether the aggregate harvesting costs are in fact being minimized. Such models and analyses are critical to guiding fisheries management decisions whose general purpose is to maximize net national benefits and optimally distribute those benefits.

Data is being requested for both the 2000 and 2002 shrimp season. Anecdotal information suggests that the most recent year for which we can collect data, 2002, was one of the worst for this fishery due to depressed market prices for Gulf shrimp, the high influx of less expensive imported product, increases in insurance premiums following Sept. 11, 2001, and rising fuel costs. Conversely, the year 2000 was one of the best years during the last decade in terms of economic performance. Production levels were high and prices maintained their levels, even with higher production. Thus, comparing data from these two years will help to determine which factors have been most influential in causing erosion in profitability and will help to determine the actual impact that imported product has had on U.S. Gulf shrimp fishermen. In the future, annual assessments (after

additional OMB approval) are needed to account for all impacts and the causes and sources of overall trends in cost and revenue data.

Part 1, Vessel information

Question 1.1 verifies who is being interviewed, the vessel name, US Coast Guard documented number, total landings, if landings are measured as “head on” or “head off,” and total gross revenues for two years. This information will allow NOAA Fisheries to link this vessel information with other pertinent data, such as permit and catch information, located in other datasets. Landings and gross revenues are being requested to provide complete data at the individual vessel level. Although these data are collected by other means, it is not consistently complete or detailed at the individual vessel level.

Question 1.2 asks which port/state the vessel owner considers the base of the vessel’s operations. This port may be different than the port(s) where primary landings may occur, but is likely the port where provisioning, maintenance and other cost-related activities occur.

Questions 1.3-1.5 inquire about where fishing activity occurred (in the EEZ or not), how many shrimp fishing trips and fishing days were taken inshore and offshore, and how many days at sea were related to activities other than shrimp fishing. This provides information about the average length of trip and how many days of fishing occurred during a calendar year, and will help to determine which fishermen are full time participants, which are part time, the level of dependency that each has on this fishery, and the potential impacts that regulations may have on them.

Questions 1.6-1.10 attempt to discern the amount of financial capital that has been invested in the vessel and the current value of that capital. This information can be used to estimate various rates of return on the owner’s investment. The expected rate of return is a critical factor in the owner’s decision to invest further in the vessel, and whether to remain in the fishing industry. Levels of net investment should be indicative of the industry’s economic health (i.e. negative net investment indicates an industry in decline). Further, profitable vessels should be associated with higher levels of investment. Similarly, comparisons of the original purchase price and current market value should also be indicative of trends in the industry’s health. The current market value of capital can also be considered an input in the production process.

Questions 1.11 -1.12 collect information pertaining to costs related to vessel haul-outs, hull repair and maintenance. Since vessels may not be hauled out once each year, we ask for the number of years between haul-outs (that is, to fill in “once every (blank) years”).

Part 2, Major Mechanical Systems

This question will gather information on the capital investment of the engines, reduction gear, generators, compressors, and chargers used on the vessel, as well as fixed annual costs such as overhauling or replacement costs. Engine characteristics affect how fishermen can and do use their vessels and the related direct costs, such as fuel use, which affects level of production, revenues, and profitability associated with the vessel’s operations. In addition, the engine make and model information will be useful in comparing fuel use, overall costs, and other engine characteristics with databases maintained by engine manufacturers.

Part 3, Trawl Gear Information

Questions 3.1 - 3.2 request information regarding the capital investment of the specific trawl gear used; types and number of nets, doors, and cables used or kept on board ready for use; replacement costs; and percent of time used; all of which will differ between individual fishermen. The detail provided in these answers is not available from alternative data sources. Gear characteristics affect how fishermen can and do use their vessels, and thus the costs, level of production, revenues, and profitability associated with the vessel's operations.

Question 3.3 specifically identifies what type of Bycatch Reduction Devices (BRDs) are in use on the vessel, how frequently, and their average costs. This information will help to assess the socioeconomic impacts of BRD regulations on individual fishing enterprises and fishing communities, and has not been gathered before.

Question 3.4 specifically identifies the type and number of Turtle Excluder Devices (TEDs) which are in use on the vessel (if multiple ones are used). By region, TED regulations specify minimum sizes and types that can be used, but not maximum sizes. Information about the types of TEDs actually in use will help to assess the socioeconomic impacts of federally-mandated TED regulations on individual fishing enterprises and fishing communities, especially in light of recent changes to the TED regulations. Not only are there direct costs associated with each type of TED, but TEDs, as with BRDs, affects the efficiency of the trawl gear in terms of its ability to catch shrimp, and thereby reduces catch per unit of effort (CPUE) and/or increases the cost per unit effort, resulting in reduced profitability. Information on the relative performance of alternative TEDs and BRDs will be useful to both managers and fishermen.

Part 4, Electronics

Questions 4.1-4.2 will gather information regarding capital investments for all on-board electronics, and replacement costs of those electronics. These questions attempt to discern the amount that has been invested in on-board electronics and expected future investments in on-board electronics. Expected future levels of investment in on-board electronics compared to the past investment in on-board electronics should be indicative of the industry's economic health. Further, profitable vessels may be associated with higher levels of investment in on-board electronics. This is a testable hypothesis. Other research has shown that a certain level of experience or combination of experience and technology is more important than technology alone. On-board electronics affect how fishermen can and do use their vessels, and thus the costs, level of production, revenues, and profitability associated with the vessel's operations.

Part 5, Annual and Variable Costs

This subsection of the survey instrument asks questions pertaining to annual total of non-labor variable costs (fuel, oil, food), some fixed costs (e.g. insurance, costs of leases adjacent to docks), labor costs (**Questions 5.5 and 5.6**), and other costs germane to vessel's profitability (e.g. return on investment) and cash flow. These questions can be used to construct input demand function, cost functions, and production functions, all of which are needed to conduct the types of analyses mentioned previously.

Questions 5.1 - 5.4 pertain to the three types of non-labor costs (fuel, oil, and food) associated with the annual number of trips by a given vessel. They are generally related to or a function of the annual level of fishing effort. Fuel costs are a substantial variable cost for trawl fisheries. For fuel, we are also requesting information on the annual average quantity of the fuel purchased and the

average price per gallon. Both fuel quantities and prices are requested since total annual costs can change due to a change in quantity purchased *or* the price per unit, and this may affect level of production. These costs may also be influenced by location, since these vessels operate out of multiple states in the Gulf region.

Questions 5.5 - 5.7 are meant to obtain total annual payments to the captain and crew, as well as payroll taxes for the total labor expense. This information will also be used with the information obtained through Question 7.4, which asks about the crew and captain share system. These payments basically represent the flow of annual income to the crew members and captains associated with the vessel. From the captain and crew's perspective, their share of the vessel revenues determines the incomes of their respective households. Changes in annual income received can affect the captain's and crew members' decisions to continue working in this particular fishery, and/or in fishing as a vocation. These data will allow analysts to determine how various factors, such as changes in regulations, may affect the incomes of crew.

Question 5.8 collects information on all types of insurance, related to the vessel, and health benefits. These are fixed costs, that, when incurred, are paid regardless of whether the vessel is used or not, or generates any revenue. These costs are borne entirely by the owner. The lack of hull and other related vessel insurance could be indicative of the industry's economic health. If sufficiently high, vessel owners may choose not to carry full hull or P&I insurance, and thus put their business at risk. Further, health insurance is a type of compensation, and the presence or the lack thereof is a non-economic social aspect of the human environment.

Questions 5.9 - 5.12 relate to non-labor, annual costs associated with docking or mooring arrangements, utilities while at the dock and miscellaneous hardware (e.g. cables, ropes, etc.). These costs vary across time and vessels and are typically reported on an annual basis.

Questions 5.13 - 5.15 ask for annual costs associated with repair and maintenance of the vessel, gear, and electronics, but exclude replacement costs such as for new trawl doors or nets, since these are covered in Parts 3 and 4 and are part of the capital investment. Question 5.15 asks for costs that may occur annually and is different than the costs requested in Question 1.11, which are costs that are not typically incurred every year.

Question 5.16 asks for annual depreciation charges and the type of depreciation method used. Depreciation expenses can be calculated in many ways, according to the different accounting methods. These expenses may or may not be relevant depending on the type of analysis being conducted. For example, they may be relevant in determining the net returns to a vessel, but they are not relevant in a cash-flow analysis.

Questions 5.17-5.23 ask for other costs that are basically fixed, since they do not vary according to the level of fishing activity. These costs are paid regardless of whether the vessel is used or not, or has generated revenue, and are borne entirely by the owner. If sufficiently high, fixed costs can affect the probability of entry and exit into and out of a fishery.

These questions collect information on various Federal, state, and local fees (**5.17**); property tax paid related to this particular fishing vessel (**5.18**); professional service (i.e. legal, accounting, association dues; **5.19**); and vessel management fees (**5.20**), and vehicle expenses associated with the fishing operation including vehicle repairs, depreciation and fuel (**5.23**). **Questions 5.21 and**

5.22 gather information about annual payments on long term, short term, and operating loans.

Question 5.21 asks for the combined principal and interest paid, rather than breaking it down. In terms of cash flow and profitability, loan payments, as a fixed cost, can be critical to annual financial performance of the vessel operation. In addition, loan interest rates can be critical component to cross-sectional financial ratio analysis (e.g. interest expense ratio) with a fishery and between fisheries.

Questions 5.24 & 5.25 asks for annual totals of variable costs associated with the cooling and/or freezing of the vessel's catch. For ice, we request information on the quantity purchased, the average price per unit, and the unit in which the input was purchased (blocks, bars or pounds). Ice quantities and prices are requested since total annual costs can be a substantial variable cost in warm-water shrimp trawler fisheries and is dependent upon the level of fishing activity. Likewise, the cost of salt and other freezing supplies for freezer-trawlers is dependent upon the level of fishing activity. Similar to fuel questions, these pieces of information can be used to construct input demand functions, cost functions, and production functions. Furthermore, the use of ice vs. freezing systems, as the predominant method for preserving a trawler's catch, may be associated with vessel size, mobility, duration of trips, and geographical range of a given vessel, each of which affects the vessel's fishing capability. Additionally, shrimp fishermen may convert storage methods between ice and freezers, which are considered more versatile. The large freezers used on shrimp vessels allow shrimp fishing at greater distances from shore, and therefore provides access to deeper-water shrimp species. In contrast, ice storage takes up less space on board, but requires vessels to stay closer to shore. As with fuel usage/capacity, these data are needed to partition the fleet for economic and management assessments of shrimp fleet harvest capacity and efficiency.

Collection of this information annually is of great benefit, since compilation of a historical database of these parameters will allow for trends to be assessed to individual vessels and the fleet (particularly the ratio of ice vs. freezer vessels) and its harvest capacity.

Questions 5.26 and 5.27. These questions capture any other costs not covered by previous questions.

Part 6, Net Revenues

Questions 6.1 and 6.2 relate to the annual net revenue (fishing related gross revenues minus fishing related costs) associated with shrimp and non-shrimp fishing activities (e.g. charter fishing, etc.) with which a given vessel may be involved. Net revenue is the income flowing to the vessel owner(s) and represents the income related to the owner's overall management (i.e. excluding his skills as a captain) of the vessel operation and related assets. Whether or not the owner's share of the net revenues is sufficient to cover costs and provide a reasonable rate of return on his capital investment and related management skills will affect his decisions to remain in the fishery, switch to another fishery, or exit from fishing altogether. The response will provide the researchers with an understanding of how fishermen estimate costs and revenues compared with how economists estimate it.

Part 7, Vessel Owner, Crew members and Crew Compensation

Question 7.1 requests information regarding the fishing business' form of legal organization and identifies whether the vessel is operated directly by the owner (owner-operator). Economic theory suggests that form of organization can impact who makes decisions within the fishing business, how those decisions are made, and what the goals or objectives of the fishing business might be.

Further, form of organization can also impact how efficiently the fishing business operates and the extent to which it can access and obtain capital resources for investment purposes. Form of organization also has repercussions with respect to tax status and legal liability, which can in turn influence the fishing business' behavior.

Question 7.2 asks if the vessel owner owns other fishing vessels, and requests their identification in terms of vessel name and its U.S. Coast Guard or state documentation number. This information is necessary to determine whether a vessel or business is considered "small" by OMB for purposes of the Regulatory Flexibility Act.

Questions 7.3 and 7.4 ask for number of crew members used on an average trip and increases in the number of crew members if larger than normal catches are expected. The number of crew members directly relates to one of the vessel's most important variable costs, labor, and within season changes in crew sizes is germane to estimating vessel profitability and aggregate economic impacts associated with the early stages of season and/or area openings.

Question 7.5 – 7.9 asks for details on how payments are made to crew, whether the position is paid as a percent share or piecemeal rate (per box), and whether the crew pay part of the variable trip costs. Based on these percentages, net income can be calculated using the data from other sources (landings data) which basically represents the flow of income to the various fishermen associated with the vessel. Specifically, in **7.5** we also request information regarding fishing experience, where the crew member lives, whether the crew member is also a member of the owner's family, and what their remuneration is. The question is in the form of a table to facilitate data recording and entry. We hypothesize that the crew members' particular jobs or functions on the trip (e.g. captain, deckhand, rigger, header) and their relationships to the other crew or the owner will partially affect the size of crew and the share they receive. The presence of payment differentials may serve as an incentive for crew to invest in their own human capital. That is, a beginning header may decide to stay with a particular boat or remain in fishing in general if the opportunity for advancement and higher pay is present. Further, if the crew shares are not equal, the relative impacts of potential regulatory measures will vary across different types of crew members. Familial relationships can affect how the business operates and the degree to which people are tied to each other, the industry, and the communities in which they live. The presence of familial relationships will likely affect a fisherman's willingness to continue in the fishing business. The location where crew members live is germane to estimating and predicting regulatory impacts on fishing communities. **Question 7.6** asks for the number of years that the owner has been involved in commercial fishing because it is hypothesized that the owner's experience may be partially linked to the vessel's relative profitability. **Question 7.7** asks whether any variable costs (groceries, food and ice) are deducted before shares are allocated, and additional detail on how these costs are split between the vessel owner and crew members (as percentages). This information will be necessary to accurately calculate net income. There is no other data effort that gathers information about the income accruing to individual crew members. **Questions 7.8 and 7.9** ask whether any annual bonuses were provided. The basis of the total remuneration can affect the productivity of the crew and boat.

Part 8, Effort Management in the Shrimp Fishery

Questions 8.1 –8.3. This section is unlike the rest of the survey, and is designed to assess the attitude of individual vessel owners toward several types of effort management programs that may be proposed for the Gulf of Mexico shrimp fishery. Information on attitudes is an important part of the social factor analysis. Many of these effort management regimes are new to the entire Gulf

Region, thus this section in part will educate the fishermen about their distinction. For **Question 8.1**, vessel owners will be asked to qualitatively describe their attitude using the terms ‘support,’ ‘neutral,’ or ‘oppose.’ For **Questions 8.2 and 8.3**, they are asked to qualitatively describe their attitude using the terms ‘more likely’ and ‘less likely.’ No other data collection effort exists to assess the shrimp fishery vessel owners of their attitude towards these effort management systems. Attitudes about the industry and its management will likely indicate the fishermen’s probability of remaining in the industry under alternative management structures. They will also indicate a fisherman’s willingness to comply with newly enacted rules and regulations.

SECTION II: Permit Holder and Crew Member Demographics

The general purpose of this set of questions is to collect data that describes the social and economic nature of fishery participants and their communities (i.e. the human environment or social system). The data can also be used to identify the various social networks to which individual fishermen belong. This information will aid in determinations of whether and to what extent fishermen are dependent on the fisheries in which they participate and to what extent they consider fishing a way of life for them and their families. Social factor analysis can reveal differential impacts across different regions, communities, and groups of fishermen (in general, different social structures) and thereby help explain their different responses to regulatory changes. Without such information and analysis, it would be impossible to render impact determinations of potential management measures, as is generally done in Social Impact Assessments, Fishery Impact Statements, and Environmental Impact Statements and Environmental Assessments. In general, this data will assist in gauging the social costs and benefits derived from a particular fishery and management thereof, which should be included in any determination of net national benefits.

Part 9, Vessel Owner Information (only)

Questions 9.1 – 9.4 ask for basic demographic information about the vessel owner (or his/her designee) such as age, level of education, marital status, and numbers of persons in their household. Demographic characteristics of the fishery work force is one social factor category necessary to conduct a proper social impact assessment. These characteristics can be used to classify fishermen into groups who are likely to share similar associations (i.e. belong to the same network or system), behaviors, and beliefs or attitudes.

Questions 9.5-9.8 will obtain information on the cultural (race) and social structure of the vessel owner and his/her family. These questions are organized as they are currently used and developed by the Census Bureau. Social factor analysis is the analytical tool used when constructing a social impact assessment. Such analysis involves the identification and analysis of social factors (such as religion), its social-cultural and community context, and its participants. Four categories of social factors have been identified by NOAA Fisheries and various academic researchers as being critical to social factor analysis. One of these categories is the cultural issues of attitudes, beliefs, and values of fishermen. **Questions 9.5 - 9.6** asks for information about the fishermen’s race and primary language of communication. **Question 9.5** identifies whether the owner is of Spanish, Hispanic, or Latino ethnicity, and provides additional information regarding the ethnic composition of the “white” race within this population. Anecdotal information suggests that people of this ethnic background play a particular and important role in this fishery, particularly in South Texas communities. **Question 9.6** asks specifically about race, as it is asked in the Census. **Question 9.7** asks which language is spoken at home. As with demographic characteristics, language may be a factor that bonds or separates various fishermen. That is, these are the initial questions that attempt to obtain information on the social structure of the fishermen, their families, and the communities to

which they belong. For example, those who primarily communicate in a particular language are more likely to associate and conduct business with other fishermen who do the same. In general, fishery managers need to know how prevalent language barriers are with their constituency. Lack of communication will result in poor management, or at least perceptions of poor management. Finally, a person's religion is a general reflection of some composite set of attitudes, beliefs, and values. Religion or religious affiliations (**Question 9.8**) are clearly a potentially defining characteristic of a connected group of people, or what we call a community. A common religion, or set of values and beliefs, is one factor that "connects" people. Anecdotal information suggests that, in communities where fishermen of Vietnamese descent play an important role, their respective religion affects which people, vessels, and businesses they cooperate with and associate. Knowledge of this factor could help us determine what the bounds of a particular community are, geographically speaking, and who belongs to it. We cannot identify fishing dependent communities until we first determine which groups of people constitute a community (fishing or otherwise). Once we identify these communities, and the social systems in general within which fishermen operate, we should be able to determine how changes in fishery management will affect fishermen's lifestyles, their social and interaction patterns, their choice of where to live, and in general how they will respond. In turn, those responses will have a feedback effect on the structure of the communities and social systems to which they currently belong. These are the types of impacts we are interested in when conducting social impact assessments.

Question 9.9-9.10 are designed to determine the degree to which the vessel owner (or his/her designee) and his/her family are dependent on a particular fishery or the fishing industry in general (i.e. harvest and no-harvest sectors). Dependency is mainly gauged in terms of income dependency. **Question 9.9** identifies other occupations that the particular owner is engaged, and the time of year of that work. Not only does this identify other income sources, but from this, researchers may be able to discern if other job opportunities exist for fishermen, if particular fisheries cease to be economically sustainable for all the fishermen currently engaged in it, or if management measures lead to effort limitations. **Question 9.10** specifically asks the owner to indicate his/her household income category (categories are based on those currently used and developed by the Census Bureau). This information in conjunction with the net revenue of this vessel (**Question 6**) will enable the researcher to assess actual financial dependency on the shrimp fishery. This will allow for the distributional impacts of proposed management measures to be discerned (e.g. will a particular measure have similar or differential impacts on fishermen of different means or socioeconomic status).

Parts 10-15, Information About Crew Members (1-6)

In this last section, information will be collected on up to six (6) crew members. It is intended that this section is answered by the vessel owner, and not through an interview with the individual crew members. Due to the basic nature of the questions, many vessel owners will likely be able to answer the questions based on the existing knowledge of their crew. However, in the event that they do not, the vessel owners will be receiving a copy of the full survey document prior to the face-to-face interview, thus providing them with an opportunity to gather the information on their crew in advance.

Most of the individual questions are identical to those described in Part 9, for Vessel Owner Information (only), and have the same justification. **Question 10.1 -10.4** asks for the position of the particular crew member, in order to identify that person with their crew share and expected level of income; his/her age; marital status; and level of education.

3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological techniques or other forms of information technology.

This study will use face-to-face interviewing techniques administered by contracted individuals who have been trained by a staff person from the NOAA Fisheries, SERO Fisheries Economics Office. Responses to scripted interviews will be recorded on preprinted standardized data forms that will be transmitted to the Contractor's office in Tampa, FL. The surveys responses will be entered into an Access database, designed specifically for this purpose, and data will be periodically transmitted to the SERO Fisheries Economics Office.

There will be no other means, electronic or otherwise, to submit data or information for the purposes of this study.

4. Describe efforts to identify duplication.

There is no duplication of social and economic information gathering on the Gulf of Mexico shrimp fishery. There are no comprehensive data efforts like this one conducted by any other entities. This information will be unique in its detail and specificity to individual fishing entities, their crew, expenses, vessels' ownership, and general operation.

The data collected by this survey will be linked to shrimp dealer reports data collected by NOAA Fisheries port agents and the U.S. Coast Guard Vessel Documentation program. The survey form went through several reviews to insure that there was no duplication within the form or with other surveys. Specific social and economic information to be gathered is discussed in Section 2, and is in the draft survey instrument as presented in the attachment.

5. If the collection of information involves small businesses or other small entities, describe the methods used to minimize burden.

It is unknown whether all entities in the Gulf shrimp fishery are considered small businesses. There is some anecdotal evidence to suggest that there may be some 'large' entities in the fishery. Therefore, separate requirements based on size of business have not been developed. Only the minimum data to meet the current and future needs of NOAA Fisheries management, stock assessments, and permitting programs are requested from all applicants. The results of this study are expected to improve the economic conditions of small fishing entities by affording fishery management agencies the information needed to consider social and economic factors in management plans and regulations.

6. Describe the consequences to the Federal program or policy activities if the collection is not conducted or is conducted less frequently.

Socioeconomic data was last collected by NOAA Fisheries for this fishery in 1992, over a decade ago. At that time, the data collection was a one-time survey that only obtained information for a portion of the offshore fleet based in Texas. Other previous attempts to collect costs and returns data have been similarly plagued by their small scope and/or their limited duration. Current economic and social data is needed for the Gulf shrimp fishery as a whole in order to accurately assess the

positive and/or negative impacts of federal rules and regulations. Such assessments are mandated under Executive Order 12866, the Regulatory Flexibility Act, Magnuson-Stevens/Sustainable Fisheries Acts (and the National Standards attached thereto), and the Endangered Species Act, among others. Additionally, recent legal decisions against the federal government have been handed down based on the absence of social and economic data (i.e. summer flounder litigation: North Carolina Fisheries Association, et al. versus Daley - Civil Nos. 2: 97cv339; 2: 98cv606).

According to the Small Business Administration, fluctuations in short-term profitability are important in determining whether or not small businesses are forced to exit an industry. According to various lawsuits involving the shrimp industry and NMFS, industry has severely criticized the accuracy of previous social and economic analyses related to particular Council and NMFS actions. If current and accurate socioeconomic data are not available, then the social and economic assessments of management alternatives will likewise be inaccurate, thereby potentially leading the Council and NMFS to make poor management decisions. Thus, continuous data collection of cost and earnings data are needed to satisfy these various mandates and help ensure that good management decisions are made.

7. Explain any special circumstances that require the collection to be conducted in a manner inconsistent with OMB guidelines.

The collection is consistent with OMB guidelines.

8. Provide a copy of the PRA Federal Register notice that solicited public comments on the information collection prior to this submission. Summarize the public comments received in response to that notice and describe the actions taken by the agency in response to those comments. Describe the efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported.

A copy of the Federal Register notice is attached. The Notice was published on June 11, 2003, and the public comment period closed on August 11, 2003. No public comments were received in response to this notice.

Efforts have been made to consult with persons outside the agency to obtain their views on availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported. The Contractor has assembled a team of experts with experience in survey design and the Gulf shrimp industry to facilitate development of this new, comprehensive survey, and to incorporate a wide review of the draft document.

NOAA Fisheries has documented that the data to be obtained through this survey is not currently available, and this is discussed in response to sections 2 and 6 above.

The team of trained interviewers who will be conducting the survey includes individuals who work directly with the Gulf shrimp industry. A pretest with a draft survey was completed in February 2003 in Texas with seven individual vessel owners, and particular questions were clarified,

rephrased, reorganized, and in some questions removed, based on the result of the pretest and other reviews.

It is the intent that this survey be carried out annually from this point forward, because of the paucity of existing costs and revenue data in the shrimp fishery; the fact that there can be wide fluctuations in all costs, not just variable, as well as revenue and profits costs from year to year, based upon forecasts about the shrimp stocks, market conditions in the U.S. and abroad, and current management regulations; and the future, proposed management strategies are substantially different from the current management structure. The Council and NOAA Fisheries will be requiring accurate cost and earnings data to satisfy the various mandates described in section 6, fully assess the social and economic impacts of potential management structures, and help ensure that good management decisions are made.

9. Explain any decisions to provide payments or gifts to respondents, other than remuneration of contractors or grantees.

No monetary payments of other remuneration will be made to individuals that are interviewed.

10. Describe any assurance of confidentiality provided to respondents and the basis for assurance in statute, regulation, or agency policy.

All data that are submitted are treated as confidential in accordance with NOAA Administrative Order 216-100 and the Magnuson-Stevens Act (16 U.S.C. 1881a, M-S Act § 402(b), Confidentiality of Information).

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private.

Questions of a sensitive nature will be asked of all survey participants. These questions include, but are not limited to, the respondent's financial earnings from fishing activities, business expenses, relationships among members of the crew and certain demographic characteristics (see survey instrument in the attachments). The questions are necessary for the development of social and economic assessment models. In-depth justifications for individual survey questions were provided above in section 2.

12. Provide an estimate in hours of the burden of the collection of information.

In the first year, the sample size for completed surveys is approximately 333 individual vessels or 10% of the known total number of shrimp vessels that fish in federal waters land shrimp in Louisiana, Mississippi, Alabama, and Florida. The public reporting burden for the face-to-face interviews is estimated at an average of one hour and seven minutes per interview: 15 minutes for preparation, 19 minutes for annual/fixed cost and capital investment questions (Sections 1-4), 20 minutes for annual and variable cost and price questions (Sections 5-7); 5 minutes for effort management (Section 8), and 8 minutes for socio-demographic questions (Sections 9-14, as necessary). The breakdown of estimated time per response is slightly different than that advertised in the Federal Register Notice. This is due in large part to changes in the interview methodology and a reorganization of the survey instrument, based on pre-test results, as well as industry input.

Interviewers will be contacting the individual participants to introduce themselves and schedule the face-to-face interviews at a time convenient to the vessel owner (or his/her designee). It is estimated that an average of 15 minutes will be needed by the respondent to review business records prior to the start of the interview. The estimated average time necessary to conduct a complete interview is 52 minutes. Thus, there will be an estimated total annual burden hours of 372 hours in the first year.

Each year, the actual number of active participants in the entire fishery can change. However, based on current levels, in the second year (and subsequent years), we estimate that approximately 450 to 500 individual vessels will be surveyed, or 10% of the entire Gulf of Mexico fleet. This is equivalent to 502.5 to 558 annual total burden hours.

13. Provide an estimate of the total annual cost burden to the respondents or record-keepers resulting from the collection (excluding the value of the burden hours in #12 above).

There will be no financial cost to the public to participate in this study. Information to be gathered in this study should be readily available in the vessel financial statements, recalled from the respondents' memory, or found in federal tax returns.

14. Provide estimates of annualized cost to the Federal government.

The proposed budget for the contract to conduct this work in FY 2004 is \$185,042. This includes development the sampling design, refinement of the survey instrument, translation of the survey and outreach materials into Vietnamese and Spanish, staff trainings, conduct of the survey in four states, database development, data entry, preparation of all reports, and all associated travel.

The estimate of annual costs for NOAA Fisheries staff involvement is \$14,000, comprised of \$12,000 in staff time (and benefits) and \$2,000 in travel costs

15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB 83-I.

There are currently no annual federal social and economic data efforts that are gathering information on costs and revenues to the Gulf shrimp fishery. Only value of landings is collected by port agents or through dealer reports, but it is not consistently complete, not detailed at the individual vessel level, and not comprehensive enough for full economic and social analysis.

This is a new survey effort, therefore all the burden hours and costs changes identified above are program changes.

16. For collections whose results will be published, outline the plans for tabulation and publication.

These data will be published in summarized format and generalized tables in an annual NOAA Fisheries economic report. A final project report will provide documentation about the survey methodologies, survey instrument, statistical and random sampling design, and an assessment of the validity of the collected data.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons why display would be inappropriate.

The OMB approval number and expiration data will appear on the first page of the interview form (see attachment) that is mailed to individual participants. Additionally, the respondents will be briefed before the study actually begins and they will receive printed information concerning the study. The printed information will include the OMB approval number, expiration date as well as other important information to facilitate their interviews and compliance with applicable laws.

18. Explain each exception to the certification statement identified in Item 19 of the OMB 83-J.

There are no exceptions to the certification statement identified in Item 19 of the OMB 83-I.

B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

Please see the attached documentation that contains two reports that document and describe in great detail the statistical methodology to be used and their justification.

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g. establishments, State and local governmental units, households, or persons) in the universe and the corresponding sample are to be provided in tabular form. The tabulation must also include expected response rates for the collection as a whole. If the collection has been conducted before, provide the actual response rate achieved.

The potential respondent universe for all five Gulf states is currently estimated at 4440 vessels. These vessels predominantly land shrimp in the Texas, Louisiana, Mississippi, Alabama, and Florida. This number is subject to change slightly from year to year, due to new entrants, owners and vessels leaving the fishery, or changes in vessel ownership and fisheries in which that vessel engages.

During the pilot survey effort in year one in Texas alone, there were 1107 possible vessels in the sample universe, and the total population to be sampled was 126, or approximately 11% of potential vessels. The initial goal was to interview 10% of the sample universe, however, given the initial sample sizes for each stratum and based on a proportional allocation, the total initial sample size was slightly greater than 11% of the population because all strata were allocated at least one sampled vessel, even if 11% of the stratum size was less than 0.5.

In the first year of the full survey effort, only vessels that predominantly land shrimp in Louisiana, Mississippi, Alabama and Florida will be involved, since data has already been collected for 2002 in Texas. This will allow data to be compared between each of the states. The total universe for these four states at this time is approximately 3324 vessels, thus sample size is expected to be 333 (10%) or slightly higher. In following years, all five Gulf states will be surveyed, and it has been estimated that total sampling would not exceed 500 vessels.

Estimated response rate is 60%, similar to other socioeconomic surveys and due to the methods being employed to maximize response rates for this project, as described under the response to B3, below. The sampling protocol design deals with adjusts for nonresponse through the use of sequential sampling methods. These methods are described in great detail in the second report attached.

2. Describe the procedures for the collection, including: the statistical methodology for stratification and sample selection; the estimation procedure; the degree of accuracy needed for the purpose described in the justification; any unusual problems requiring specialized sampling procedures; and any use of periodic (less frequent than annual) data collection cycles to reduce burden.

The first report attached details a sampling and estimation strategy that may be used to provide both point and interval estimates of fleet-wide total and average values for responses of interest in the planned survey. It is strongly believed that some stratification of the population of shrimp fishing vessels should be used to ensure coverage of various sectors that may exist in the fleet and possibly improve efficiency (i.e. reduce variances) of the resulting estimators of the population values. The basic plan to be used is that of post-stratification, in combination with a highly stratified initial sample designed to provide coverage of all sectors of the fleet. The initial strata are primary port, size of vessel (two categories based on length), and average price per pound in 2002 (two price categories, above and below average for a given level of total landings). Based on the number of ports (or county) by state, the total number of sampling strata by state will vary from 6 to 56. List of ports by state is provided below.

<u>STATE</u>	<u>PORT/COUNTY</u>	Alabama	Baldwin
Florida	Monroe	Alabama	Mobile
Florida	Lee		
Florida	Hillsborough	<u>STATE</u>	<u>PORT/COUNTY</u>
Florida	Pinellas	Mississippi	Jackson
Florida	Franklin	Mississippi	Harrison
Florida	Gulf	Mississippi	Hancock
Florida	Bay		
Florida	Okaloosa	Louisiana	St. Tammany
Florida	Escambia	Louisiana	Orleans
Florida	Charlotte	Louisiana	St. Bernard
Florida	Levy	Louisiana	Plaquemines
Florida	Manatee	Louisiana	Jefferson,LA
Florida	Citrus	Louisiana	Lafourche
Florida	Hernando	Louisiana	Terrebonne West
		Louisiana	St. Mary

Louisiana	Iberia	Louisiana	Grand Isle
Louisiana	Vermillion	Louisiana	Terrebonne East
Louisiana	Cameron	Louisiana	East Cameron

Full detail of the sampling plan is provided in the attachment.

3. Describe the methods used to maximize response rates and to deal with nonresponse. The accuracy and reliability of the information collected must be shown to be adequate for the intended uses. For collections based on sampling, a special justification must be provided if they will not yield "reliable" data that can be generalized to the universe studied.

Several methods have been/will be in use to maximize response rates for this project. First, under contract to NOAA Fisheries, the Gulf and South Atlantic Fisheries Foundation conducted an extensive outreach and education program for Gulf shrimp fishermen regarding the collection of socioeconomic data in 2002. The outreach techniques used included small luncheon meetings, formal workshop environments, and one-on-one/ small group contacts on the waterfront. Approximately 136 individual members of the shrimp fishing industry Gulf-wide were contacted, and since many of the contacts were with fleet owners, as well as individuals or companies that manage and/or buy product from multiple vessels, over 400 vessels were involved. The overall purpose of this effort was to begin to educate the Gulf shrimp fishing industry of the significance of this new annual social and economic surveying effort, and the importance of their cooperation to its success.

Secondly, the success of the 2002 outreach effort has confirmed that the use of personal interviews rather than other surveying methods is preferable when trying to gather the types of social and economic data requested in this survey. Several of the individuals involved in the 2002 outreach efforts are part of the team of interviewers of this survey. All members of the team were chosen due to their long-standing and extensive familiarity with the shrimp fishing industry, including the large Vietnamese component. These interviewers have gained a level of trust from the shrimp fishermen, which is paramount for this efforts success.

Third, outreach activities are on-going as a follow-up to the personal contacts made last year, and as a way to prepare members of the Gulf shrimp fishing community for the initial contact by mail and telephone. In March 2003, members of the project team participated in a well-attended Gulf Shrimp Symposium held in Houston, and distributed fliers announcing the survey effort. Further efforts will include articles in industry publications, posting information in industry and NOAA websites, and participation at other industry events.

Finally, creation of annual economic reports, which has been lacking for this industry is expected to encourage participation by individual fishermen. It is anticipated that data will be reported for various groups of fishermen (by vessel size, port, etc.) which will allow vessel owners to compare and evaluate their operations relative to others in the same group in terms of ability to generate revenues, cost efficiency, and profitability.

4. Describe any tests of procedures or methods to be undertaken. Tests are encouraged as effective means to refine collections, but if ten or more test respondents are involved OMB must give prior approval.

Part 3 of this survey, which asks for details about trawl gear used and owned, was developed and tested during the outreach activities in 2002, described above in #3. Nine volunteer industry participants, as prescribed by OMB guidelines, were selected to fill out the draft form for pre-testing purposes, and their feedback has helped to shape the existing survey design.

A pretest with the entire draft survey was completed in Texas during February 2003 by two of the interviewers with seven individual vessel owners, and particular questions were clarified, rephrased, reorganized, and in some questions removed, based on the result of the pretest and other reviews. The cooperating permit holders were selected for interview and survey analysis because of variation that existed in their shrimp operations, ethnicity, and/or fishing practices. Results from the pretest were written up, and modifications were made to the draft instrument. Additionally, Interviewer notes were added to add clarification on particular survey questions that might have appeared confusing.

After modifications were made to the draft survey, a training was held for all interviewers to review each question, prepare for actual interviews, and to benefit from a review of the pretests that had occurred. New trainings are being planned for the other four states in late 2003 and early 2004.

5. Provide the name and telephone number of individuals consulted on the statistical aspects of the design, and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

Dr. Mark Kaiser of the Department of Statistics at Iowa State University was consulted on the statistical aspects of the sampling design used in Texas for the pilot survey efforts, and he continues to be the statistician for the project as it expands to the other four states. In addition to review by Dr. Michael Travis, NOAA Fisheries Economist, his work was reviewed by Marcus Hartley and Patrick Burden of Northern Economics Inc, and Raymond Rhodes, Independent Fisheries Economist, members of the project team. Dr. Kaiser and Dr. Walter Keithly, Louisiana State University, will assist Dr. Travis in assessing the success of the pilot survey effort and any potential biases that may have occurred, to help refine the survey for the other states.

MRAG Americas, Inc. is the contractor for this survey effort. In Texas, they subcontracted five individuals based who have been conducting the surveys and collecting the social and economic data. Each individual has direct experience working with the Texas shrimp industry as either Sea Grant Extension Agents, observers on Gulf shrimp vessels, or as past owners of shrimp fishing businesses.

Five staff have been identified and additional staff is being sought to conduct the surveying effort in the other four Gulf states. Like their Texas counterparts, the identified interviewers also work directly with fishermen, have extensive experience in social or economic sciences and surveying techniques, or have been directly involved in shrimp fishing businesses.

Analysis of the information gathered will be conducted by staff at NOAA Fisheries. However, development of the database to manage the data collected and allow it to be linked with other NOAA Fisheries databases is being handled by MRAG Americas.

Contact details for Dr. Kaiser and Heidi Lovett, Project Manager at MRAG Americas are:

Mark Kaiser, Ph.D.
Department of Statistics
Iowa State University
Ames IA 50011
tel: 515-294-8871
fax: 515-294-4040
email: mskaiser@iastate.edu

Heidi Lovett, Project Manager
MRAG Americas, Inc.
110 South Hoover Blvd, Suite 212
Tampa, FL 33609-2458
tel: 813-639-9519
fax: 813-639-9425
email: heidi.lovett@mragamericas.com

LOUISIANA, MISSISSIPPI, ALABAMA, AND FLORIDA OFFSHORE COMMERCIAL SHRIMP SURVEY FOR THE 2003 SEASON

Greetings:

You have been randomly selected from over 3,314 offshore commercial shrimp fishermen in Louisiana, Mississippi, Alabama, and Florida to help NOAA Fisheries better understand your industry. NOAA Fisheries would like to make this study as statistically valid as possible, so it is important that you, and the others who are selected, participate.

This survey focuses on collecting financial information on shrimp fishing businesses, and social data about the people who catch shrimp in Louisiana, Mississippi, Alabama, and Florida. Our primary goal is to gather information that will help fishery analysts assess how regulatory measures that might be proposed in the future will affect your bottom line, your family and your community. Collecting this information is needed to ensure that national goals, objectives, and requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MFCMA) and other laws are met. Responses to this survey are voluntary, but fishermen who take part in economic studies are protecting their own interests.

The survey is being conducted by MRAG Americas, Inc. through a contract issued by the Fisheries Economics Office in the Southeast Regional Office of NOAA Fisheries. A summary report will be developed from this effort, but all individual vessel data is kept strictly confidential as required by Section 402(b) of MFCMA and NOAA Administrative Order 216-100, "Confidentiality of Fishery Statistics."

In developing this survey form, we have tried to ask as few questions as possible. For example, we will be relying on state and federal permit, and US Coast Guard Documentation data for information about your fishing vessel. The public reporting burden for completing this survey is estimated to average one hour and seven minutes¹.

The survey will be conducted by personal interview. In the next several weeks you will be contacted by one of four interviewers or the Project Manager to schedule a time to conduct the personal interview.

The interviewers include:	Gary Graham	Julie Falgout	Diane Keithly
	Heidi Lovett	Michelle Zacks	Jennie Mandeville
	Raymond Rhodes	David Rydene	(others)

¹ Public reporting burden for this collection of information is estimated to average one hour and seven minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Dr. Michael Travis, Fisheries Economics Office, Southeast Regional Office, NOAA Fisheries, 9721 Executive Center Drive N., St. Petersburg, FL 33702-2432, (727) 570-5335, email: mike.travis@noaa.gov.

Project Manager: Heidi Lovett

We are providing this copy of the survey to you to help you understand the survey and its questions and to prepare for the interview. You may use this form as a worksheet, but it will not be collected.

The survey is divided into two main sections:

Section I asks about the gears you use in your fishing operation and the costs you incur. This information will allow economists from NOAA fisheries to estimate net revenues and crew income in the fishery under current conditions. In the past, limited information was available for these estimates, and regulations were implemented without solid estimates of how the new regulations would directly affect earnings in the fishery. We hope that by gathering this information now, we will gain a new tool to work with industry to help manage the offshore shrimp fishery in a sustainable way that also allows shrimp fishermen to continue earning a living in the Gulf of Mexico shrimp fishery.

Section II asks for information about you, your family, and your crewmembers. These questions will ask about your education level, your household income levels, other jobs you might hold, and your race. This information is necessary to understand your relative dependence on the shrimp fishery, and other opportunities for income generation you or your family members have. Race demographic information is being requested so that we can document whether new or existing regulations are balanced in terms of the different groups of fishers they affect, or if they discriminate unfairly against a certain group. Studies of this type, known as “environmental justice” assessments, are required when any new regulation is proposed. This section will also ask information about your crewmembers—in particular about where your crewmembers live, their ages and their ethnicity. Currently very little information is collected about crewmembers. This information will help analysts gain additional understanding about how the fishery contributes to local and regional economies. We recognize that you may not have complete information about your crew, but whatever information you can provide will be very helpful.

Thank you for your cooperation with this important survey effort! If you have any questions, please contact:

Michael D. Travis, Ph.D.
Fisheries Economics Office
NOAA Fisheries
727-570-5335
Mike.Travis@noaa.gov

Heidi Lovett
Projects Manager
MRAG Americas, Inc.
813-639-9519
Heidi.Lovett@mragamericas.com

Note: Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

Contact Documentation

This section is to be completed by the interviewer and the person interviewed. It documents efforts to contact you or your company, and indicates who spoke with whom and when.

Interviewer: _____

This section documents efforts to contact vessel owners that have been randomly selected for this interview. Once this form is begun for a single person, please continue to use it for this individual throughout the contact and interview process. Please add any information as it becomes relevant.

1. Primary Contact Information of Selected Vessel Owner

Please complete with all known information. If additional phone or contact information becomes available, please add notes in the comment sections.

Owner ☐

Designee of Owner ☐

Last Name	First Name, Initial, Suffix	Vessel ID #
Address	City	State, Zip code
Business Phone (area code & number)	Home Phone (area code & number)	Mobile Phone (area code & number)
Fax (area code & number)	Email Address 1	Email Address 2
Comments:		

2. Contact Log

Please complete the log when any attempt to contact the permit holder is made.

Owner ☐

Designee of Owner ☐

Interviewer	Date/Time	Method (phone #, email)	Disposition (e.g. busy signal, refused)

3. Indicate Time and Location for In-Person Interview:

Owner ☐

Designee of Owner ☐

Date/Time Scheduled: _____ Location: _____

Final Disposition (e.g. Interview completed, respondent refused, etc.):

4. Additional Comments

Please add any additional comments if relevant.

Section I: Fishing Operations and Costs

This section of the survey form asks questions about the vessel, gear, costs, and crew.

1. Vessel Information

The person interviewed is the (check one):

Vessel Owner ☐ Lessee ☐ Manager ☐ Captain ☐

Other ☐ (Specify: _____)

- 1.1** In order to connect the information on this form to the correct permit and vessel information, and catch information available in other datasets, please verify that the following is correct:

The following weights of landings were measured:

Vessel Name	US Coast Guard or State Registration #	Heads on/ Heads off	Total landings in 2002 Shrimp Fisheries (pounds)	Total gross revenue in 2002 Shrimp Fisheries (\$)	Total landings in 2000 Shrimp Fisheries (pounds)	Total gross revenue in 2000 Shrimp Fisheries (\$)
		ON	lbs	\$	lbs	\$
		OFF				

- 1.2** Please specify the port and state from which this vessel operated during the 2002 season: City _____, State _____

Interviewer Note: *In this case, primary port refers to the port that the operator considers the base of the vessel's operations, and is most likely the location where the vessel is kept when it is not actively fishing. This may be different from the landings ports. It is assumed that landings ports will be reported in the landings database.*

- 1.3** Did you shrimp in Federal waters (i.e. the EEZ²) of the Gulf of Mexico?

In 2000: Yes ☐ No ☐

In 2002: Yes ☐ No ☐

² The Exclusive Economic Zone (EEZ) portion of the fishery is from 9 nautical miles outward off of the Texas and West Florida coasts, and from 3 nautical miles outward off the coasts of Louisiana, Mississippi, and Alabama.

- 1.4** In 2000 and 2002, what was the number of trips and days at sea for this vessel in the offshore shrimp fishery (outside the COLREGS demarcation line³ or beach) and the inshore shrimp fishery (inside the COLREGS line or beach)?

Year	2000			2002		
Area	Offshore	Inshore	Total	Offshore	Inshore	Total
# of Trips						
Days at Sea						

Interviewer Note: If the respondent cannot break the number of trips and/or days at sea into inshore and offshore, please request and record the total number of trips and total days at sea.

- 1.5** How many days at sea did this vessel operate in non-shrimp fisheries during:
 2000 _____ 2002 _____

- 1.6** Please specify the following information about your acquisition of this vessel.

Year Purchased	Builder/Brand	Purchase Price (\$)
		\$

Interviewer Note: Builder and Brand are often indicators of the quality of the vessel. A 'Delta' vessel is much different than a 'Marco' vessel even though the length and tons may be similar. With this information, it is also possible to correlate values to values listed in trade journals.

- 1.7** Not including the purchase price of the vessel, please estimate how much you have further invested in the engines, replacement parts, gear, electronics, etc., since you obtained the vessel. \$ _____

Interviewer Note: Refurbishing the vessel so that it is seaworthy and fishable would be part of these expenses. Expenditures on repairs should NOT be included.

- 1.8** What price do you think you could have gotten for your vessel, including gear and electronics, in 2000? What if you tried to sell it today?

2000 \$ _____ today: \$ _____

Interviewer Note: If the respondent says that it is not worth anything, please that verify that the value entered is '0'.

³ The COLREGS comes from the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and demarks waters inside of the lines as Inland waters (under Inland Rules) and the waters outside the lines are COLREGS (or offshore) waters, where mariners must comply with International Navigation Rules. The line of demarcation is generally expressed in terms of latitude or longitude and appears on most navigation maps.

- 1.9** What is the equity (net value) in this vessel now (that is, the estimated amount you would receive above what you owe, if you were to sell it today)?
\$ _____
- 1.10** If you had to buy a brand new vessel today, built and equipped identical to your current vessel, how much do you believe you would have to pay for it?
\$ _____
- 1.11** How often do you pull your vessel out of the water (dry dock) for hull and other major exterior maintenance?
Once every years
- 1.12** What is the typical cost (e.g. railway fees, etc.) for hauling your vessel out of the water, and the ensuing hull maintenance? (Please include costs for cleaning, replacing anodes, and painting and repairing the hull. Please do not include engine repair/replacement in this estimate.)
\$ _____

2. Major Mechanical Systems

Please provide information about the engines, generators, compressors and reduction gear you currently use on the vessel.

Engine Code (See below)	Make/ Model	Installed horse- power or kw	Purchase Price	Year Purchased	Hours used per day	Will your next major cost be an overhaul (O) or replacement (R)	Years until you expect to replace or overhaul	Expected cost when you next invest in this engine.
			\$					\$
			\$					\$
			\$					\$
			\$					\$
			\$					\$
			\$					\$

Main Engine = 4
 Auxiliary Engine = 5
 Generator for refrig/
 processing= 994
 Engine for refrig/
 processing = 995
 Reduction gear (clutch) = 1000
 Compressor = 1001

Interviewer Note: (1) Interviewer Note: This covers not just main engines, but all sources of propulsion/power, such as auxiliary engines/generators (which may not be measured in Horsepower) and diesel engines needed to power the freezer compressors. (2) Engine manufacturers maintain databases that indicate expected fuel use at various horsepower ratings as well as expected overhaul costs and expected hours between overhaul.

3. Trawl Gear Information

The shaded table below lists a set of codes for gear type, net type and mesh type for typical shrimping gears used. Please use the codes in the table to complete the table in the next question.

Code	Gear Type	Code	Net Type	Code	Mesh Type
A	Otter Trawl	I	2 Seam Balloon	S	Nylon
B	Butterfly Net	J	4 Seam Balloon	T	Spectra
C	Cast Net	K	Box	U	Poly
D	Skimmer Net	L	Flat	V	Other (specify)
E	Wing Net	M	Western Jib	W	Other (specify)
F	Roller Frame	N	Add-on Bib		
G	Other (specify)	O	Built-in Bib		
			(e.g. mongoose, cobra, etc.)		
H	Other (specify)	P	Other (specify)		
		Q	Other (specify)		
		J	Other (specify)		
		R	Other (specify)		

3.1 Using the codes from the table above, please specify the gear owned, gear used, percent of fishing time in 2002, replacement cost, and the typical number of years that the net may be used before it needs to be replaced.

Gear Codes	Net type code	Mesh type code	Headrope length (feet)	Mesh size (inches)	Number On Board	Number Fished/Towed	Percent of 2002 fishing time (%)	Average cost per net	Average life of net
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	
			ft	in			%	\$	

Percentages should
total 100%

Interviewer Note: *Rough estimates are ok for the last three columns.*

3.2 Please indicate replacement costs and the typical number of years each may be used before it needs to be replaced.

Interviewer Note: *If respondent doesn't specify cable types, enter total in Main Cable row and indicate "see Main Cable" in subsequent rows.*

Doors	Number of sets on board	Replacement cost per set	Average life (in years)
Aluminum Trawl Doors		\$	
Wood Trawl Doors		\$	
Trynet Doors		\$	

Cable	Total length (ft)	Cost per foot	Average life (years)
Main Cable	ft	\$	
Bridle Cable	ft	\$	
Trynet Cable	ft	\$	
Other (specify) _____	ft	\$	
Other (specify) _____	ft	\$	

3.3 In 2002, what type of BRD (bycatch reduction device) did you use? Indicate the approximate percent of total fishing time by each type used.

Bycatch Reduction Device	Percent of time used	Average cost per unit
<input type="checkbox"/> Jones-Davis	%	\$
<input type="checkbox"/> Fisheye	%	\$
<input type="checkbox"/> None	%	\$
<input type="checkbox"/> Other (please specify) _____	%	\$

Interviewer Note: *Interviewers should be sure that percentages add to 100%. If no BRDs were used then by "none" indicate 100%. If no BRD was used 50% of the time then put 50% by none and indicate percentages by other types.*

- 3.4** Please indicate the type of turtle excluder device (TED) you used by percent of total fishing time in 2002. If you own a particular type of TED but did not use it in 2002, please indicate 0% in time used, but complete the cost information.

☐ Single Grid Hard TEDs

Grid style ¹	grid size (width x height)	opening size (width x length)	Opening direction	Accelerator Used	Flap size	# on board	Cost ² per unit	% of time used
	<input type="checkbox"/> 28"x28" Gulf min <input type="checkbox"/> 30"x30" Atlantic min <input type="checkbox"/> Other ____"x____"	<input type="checkbox"/> 32"x10" Gulf min <input type="checkbox"/> 35"x12" Atlantic min <input type="checkbox"/> Other ____"x____" <input type="checkbox"/> Leatherback <input type="checkbox"/> Double-Cover		<input type="checkbox"/> Yes <input type="checkbox"/> No			\$	
	<input type="checkbox"/> 28"x28" Gulf min <input type="checkbox"/> 30"x30" Atlantic min <input type="checkbox"/> Other ____"x____"	<input type="checkbox"/> 32"x10" Gulf min <input type="checkbox"/> 35"x12" Atlantic min <input type="checkbox"/> Other ____"x____" <input type="checkbox"/> Leatherback <input type="checkbox"/> Double-Cover		<input type="checkbox"/> Yes <input type="checkbox"/> No			\$	
	<input type="checkbox"/> 28"x28" Gulf min <input type="checkbox"/> 30"x30" Atlantic min <input type="checkbox"/> Other ____"x____"	<input type="checkbox"/> 32"x10" Gulf min <input type="checkbox"/> 35"x12" Atlantic min <input type="checkbox"/> Other ____"x____" <input type="checkbox"/> Leatherback <input type="checkbox"/> Double-Cover		<input type="checkbox"/> Yes <input type="checkbox"/> No			\$	

Opening direction: A = Top-opening
B = Bottom-opening

Flap size: 1 = Std. Short
2 = Std. Long
3 = No Flap Used
4 = Double-Cover

☐ Parker Soft TEDs

opening type	Opening direction	Accelerator Used	number on board	Cost ² per unit	percent of time used
		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	

Opening type: 1 = Standard
2 = Leatherback

Opening direction: A = Top-opening
B = Bottom-opening

☐ Hooped Hard TEDs

Grid style ¹	opening size	Opening direction	Accelerator Used	number on board	Cost ² per unit	percent of time used
NMFS	<input type="checkbox"/> 25"x25" – Gulf min <input type="checkbox"/> 30"x30" – Atlantic min <input type="checkbox"/> Other _____" x _____"		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
Cameron	<input type="checkbox"/> 25"x25" – Gulf min <input type="checkbox"/> 30"x30" – Atlantic min <input type="checkbox"/> Other _____" x _____"		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	
Coulon	<input type="checkbox"/> 25"x25" – Gulf min <input type="checkbox"/> 30"x30" – Atlantic min <input type="checkbox"/> Other _____" x _____"		<input type="checkbox"/> Yes <input type="checkbox"/> No		\$	

Opening direction: A = Top-opening
B = Bottom-opening

Total for all TED use should equal 100%.

SEE FIGURES on NEXT PAGES

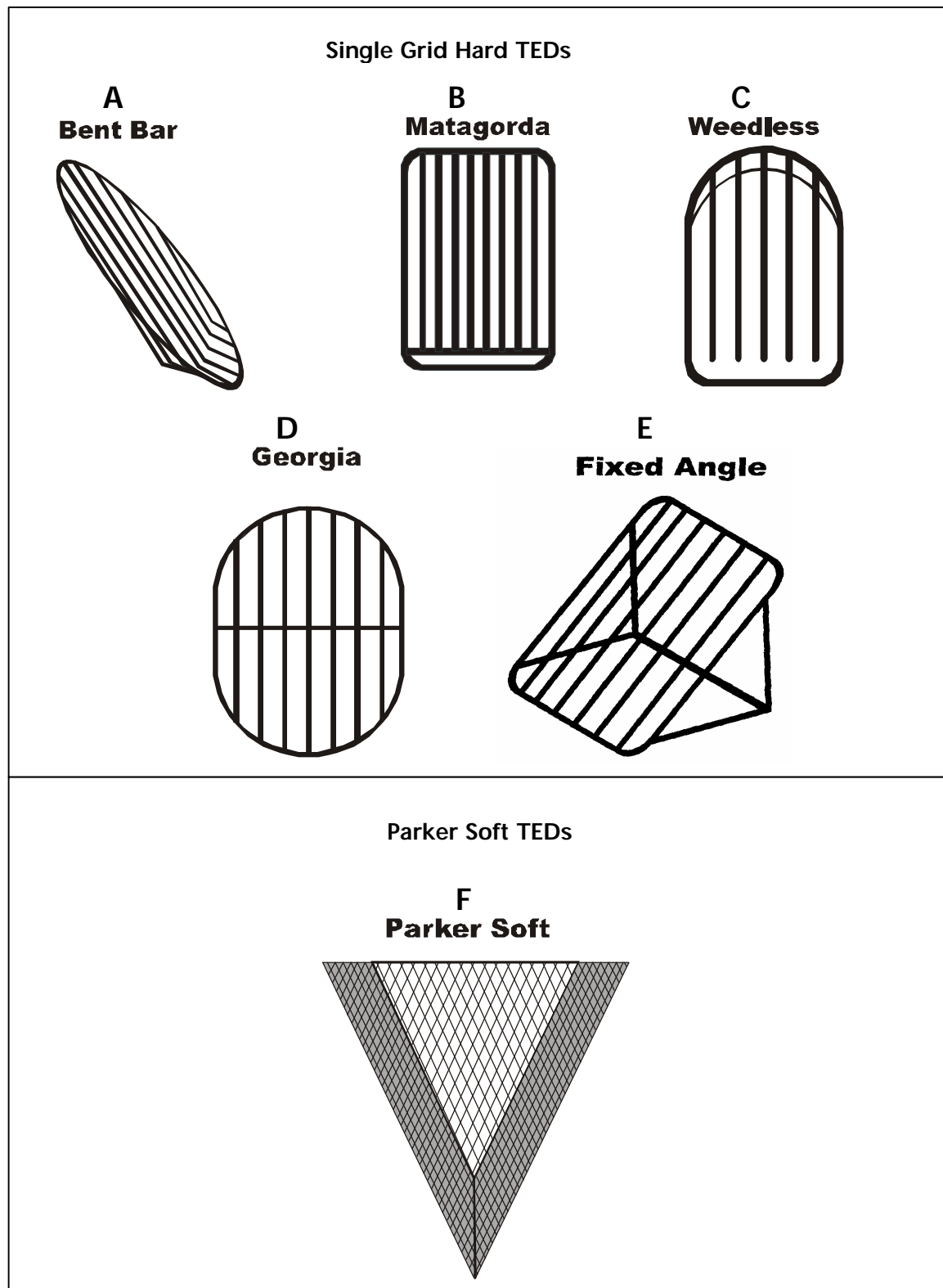
Notes:

¹See diagram

²Include cost of installing the TED

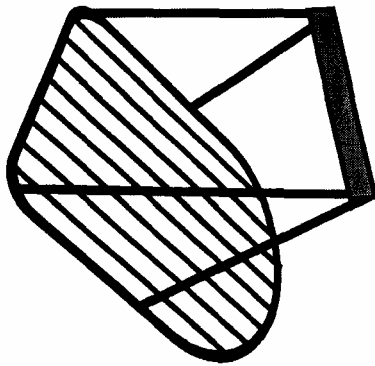
Interviewer Note: In last column, interviewers should be sure that percentages add to 100%.

Figure 1. Common Turtle Excluder Devices

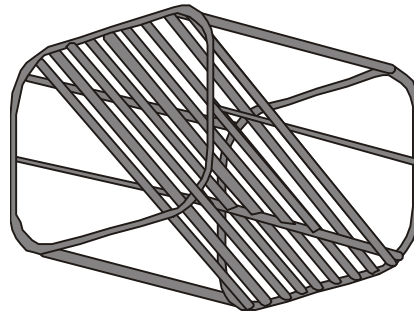


Hooped Hard TEDs

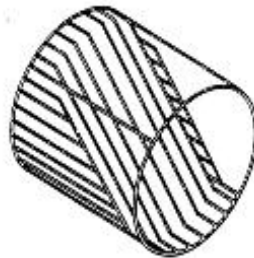
G
Coulon



H
NMFS



I
Cameron



4. Electronics

4.1 In the list below, please check off the types of electronic equipment (either in the wheelhouse or mounted on the gear) that were on-board your vessel in 2002.

If your vessel had more than one unit of a particular type of equipment, please write in the number of units. Note that this list contains types of equipment that may not be presently used in the Gulf shrimp fishery, but are used in other fisheries for which this type of information is being collected.

Item	Code	Total Number of units (including backups)	Average purchase cost per unit	Average replacement cost per unit
<input type="checkbox"/> Cell phone	907		\$	\$
<input type="checkbox"/> VHF radio	909		\$	\$
<input type="checkbox"/> CB Radio	1010		\$	\$
<input type="checkbox"/> Single sideband radio	927		\$	\$
<input type="checkbox"/> Satellite phone	1011		\$	\$
<input type="checkbox"/> Fax	904		\$	\$
<input type="checkbox"/> Plotter	1012		\$	\$
<input type="checkbox"/> Computer (including software)	925		\$	\$
<input type="checkbox"/> Printer	920		\$	\$
<input type="checkbox"/> Hailer (Boat intercom)	1013		\$	\$
<input type="checkbox"/> Loran	901		\$	\$
<input type="checkbox"/> Vessel Tracking System	908		\$	\$
<input type="checkbox"/> Radar	902		\$	\$
<input type="checkbox"/> Global Positioning System (GPS)	906		\$	\$
<input type="checkbox"/> Auto Pilot	922		\$	\$
<input type="checkbox"/> EPIRB	1014		\$	\$
Echo Sounder/Depth Recorder paper <input type="checkbox"/> video <input type="checkbox"/> digital <input type="checkbox"/>	903		\$	\$
<input type="checkbox"/> Electronic Compass	916		\$	\$
<input type="checkbox"/> Satellite Navigation System (SatNav)	919		\$	\$
<input type="checkbox"/> Radio Direction Finder	928		\$	\$
<input type="checkbox"/> Weather Satellite Receiver	917		\$	\$
<input type="checkbox"/> Wind Meter	918		\$	\$
<input type="checkbox"/> Net Pingers	946		\$	\$
<input type="checkbox"/> Temperature Profiling System	926		\$	\$
<input type="checkbox"/> Water Temperature Sensor	939		\$	\$
<input type="checkbox"/> Single direction sonar	913		\$	\$
<input type="checkbox"/> Multiple direction sonar	914		\$	\$
<input type="checkbox"/> Water salinity Sensor	943		\$	\$
<input type="checkbox"/> Other (specify) _____	1015		\$	\$

4.2 Please estimate the total cost of electronics equipment you realistically expect to spend over the next five years.

\$ _____

5. Annual and Variable Costs

Please fill out the table below indicating the annual costs to your vessel for the 2000 and 2002 season. Please include all costs including those costs shared by the crew. Do not include replacement costs. Reminder: Your individual responses will remain confidential.

Operating Costs of Vessel	2000 Estimate	2002 Estimate
5.1 Fuel (total cost including amounts paid by crewmembers)	\$	\$
5.1.1 How much fuel is purchased in an average year (gallons)		
5.1.2 What was the average price per gallon paid for fuel (\$/gallon) <i>Interviewer Note: For the above three questions, one value may be calculated. Check to be sure that it makes sense and that the respondent agrees with that value.</i>	\$	\$
5.2 Oil and lubricants	\$	\$
5.3 Groceries (total cost including amounts paid by crewmembers)	\$	\$
5.4 Total packing costs, if any	\$	\$
5.5 Total payments to captain	\$	\$
5.6 Total payments to crewmembers (excluding captain)	\$	\$
5.7 Payroll Taxes	\$	\$
5.8 Insurance (check appropriate boxes, and provide total cost). <input type="checkbox"/> Hull <input type="checkbox"/> Protection & Indemnity (P & I) Insurance <input type="checkbox"/> Health/Medical Insurance <input type="checkbox"/> Other Insurance: (Specify) _____	\$	\$
5.9 Utilities (e.g. dock electricity)	\$	\$
5.10 Misc. Marine Hardware & Supplies (stay wire cable, line, etc.)	\$	\$
5.11 Dock or Mooring Fees	\$	\$
5.12 Cost of leases of property adjacent to dock (if any)	\$	\$
5.13 Repair & Maintenance: Electronics (Please, no replacement costs)	\$	\$
5.14 Repair & Maintenance: Gear (e.g. net repairs, trawl door repairs. (Please no replacement costs)	\$	\$
5.15 Annual repair & maintenance: Hull, Engine, Reduction gear.	\$	\$

(e.g. filters. Please do not include costs from question 1.11)		
5.16 Depreciation Charges Check the type of depreciation method used (one box only) <input type="checkbox"/> MACRS 1 <input type="checkbox"/> Declining Balance 3 <input type="checkbox"/> Straight Line 2 <input type="checkbox"/> Sum-of-the-Year's Digits 4 <input type="checkbox"/> Other 5 (specify _____)	\$	\$
5.17 Cost of State or Federal Licenses/Regulatory Fees <i>Interviewer Note: Include Coast Guard inspection fees and state and federal vessel registration and licenses, export/import fees, etc. Do not include fines as these are not assumed to be repeated expenses.</i>	\$	\$
5.18 Property Tax Paid (Related to this vessel only)	\$	\$
5.19 Professional Fees (Surveyor, Accountant, Lawyer, Association dues, etc)	\$	\$
5.20 Vessel management fee, if applicable	\$	\$
5.21 Vessel and other long-term fishing related loans— principal and interest <i>Interviewer Note: An example is the loan used to purchase the vessel. In this case ask for both principal and interest payments.</i>	\$	\$
5.22 Annual Operating and other short-term fishing related loan interest <i>Interviewer Note: An example of a short-term loan is one in which the buyer lends annual operating expenses to the Owner at the beginning of the year. In this case the interviewer should not include the principal of the loan only the interest. (Because it is a short term operating loan, the expenses it covers are included in other costs collected in this survey.</i>	\$	\$
5.23 Vehicle expenses used in fishing operations (depreciation, gas, etc.)	\$	\$

5.24 If you iced your shrimp what was the...

Price for ice: 2000: \$_____/unit 2002: \$_____/unit.

Choose unit: Block (B) ☐ Bar (R) ☐ Pounds (P) ☐

(Blocks and Bars are 300 pound units)

Quantity of units used in 2000: _____

Quantity of units used in 2002: _____

5.25 If you froze your shrimp what was the...

Cost for maintaining your freezing equipment in:

2000 \$ _____ 2002 \$ _____

Cost of salt and other freezing supplies in:

2000 \$ _____ 2002 \$ _____

5.26 Please describe any other annual expenses in 2000 not already included.

2000 expense amount \$ _____

Description of expense _____

5.27 Please describe any other annual expenses in 2002 not already included.

2002 expense amount \$ _____

Description of expense _____

6. Net Revenue**6.1** Please indicate this vessel's net revenue for 2000 and 2002, excluding any crew or captain's share to you.

2000 \$ _____ 2002 \$ _____

6.2 Please indicate the net revenue from other activities for this fishing vessel in 2002. Include other non-shrimp commercial fishing, charter fishing, and non-fishing activities, but only **NET** revenue derived using **THIS** vessel.

2000 \$ _____ 2002 \$ _____

Interviewer Note: *The interviewer should be sure that numbers provided are net revenues not gross revenues.*

7. Vessel Owner, Crewmembers and Crew Compensation

7.1 Please indicate the owner's relationship to the vessel and the captain.

Owner's Relationship to Vessel	Check One	Owner's Relationship to Captain	Check One
Owner owns 100% of vessel.		Owner is always captain	
Owner owns 50% or more of the vessel, but less than 100%		Owner is captain 50% or more of trips, but less than 100%.	
Owner owns 10% or more of vessel but less than 50%		Owner is captain 10% or more of trips, but less than 50%.	
Owner owns less than 10% of vessel		Owner is captain less than 10% of trips.	
Owner leases the vessel		Owner is never the captain or crew.	
Other (specify)		Other (specify)	

7.2 Do you own other fishing vessels? Yes ☐ No ☐

If yes, how many vessels? (enter number)

Please identify these vessels.

Vessel name	US Coast Guard or State Registration #

7.3 Including the captain, how many crewmembers do you use on an average trip?

7.4 How does your crew change if you are expecting a larger than normal catch?
(fill in number): + crewmember

7.5 Please describe your typical crew including the captain.

Position (specify)	Years of commercial fishing experience	Typical crew share for this position—percent of gross revenue.	Typical piecemeal pay for this position. (specify \$ per box)	City, State, & Country where crewmember lives	Is the crewmember a member of the Owners family (Check if Yes)
			\$		
			\$		
			\$		
			\$		
			\$		
			\$		
			\$		

Interviewer Note: (1) Typical crew share for this position Interviewer should enter either a crew share or a piecemeal rate in the next column. When entering shares, make sure to stress that crew share should be expressed as the percent of GROSS REVENUE. Some Owners may normally calculate as a percent of Net Revenue—these will have to be recalculated by the Owner. Remember that Gross Revenue is listed in the first question. (2) Typical piece-meal rate for this position. Interviewer should enter either the piecemeal rate (with units) in this column or crew-share in the previous column but not both unless it is specified.

7.6 If the vessel owner is not a member of the crew, please indicate the number of years the owner has been involved in commercial fishing. _____

7.7 Do crewmembers pay shares of any variable cost items?

Yes ☐ No ☐

If yes, please complete the following table. As an example, if the boat pays 25% of the fuel and each of the five crewmembers split the remaining 75 %, then enter 25% for the boat share and 75 % for the crew share.

Variable Cost Item	Total Boat share (%)	Total Crew Share (%)
Groceries	%	%
Fuel	%	%
Ice	%	%
Other, (please specify)_____	%	%
Other, (please specify)_____	%	%
Other, (please specify)_____	%	%

Interviewer Note: If an item is not shared by the crew, enter 100 under boat share and 0 under crew share.

7.8 Did your crew receive some type of bonus in 2000?Yes ☐ No ☐If yes please indicate that total bonus amount paid for the 2000 fishing year.
\$ _____**7.9** Did your crew receive some type of bonus in 2002?Yes ☐ No ☐If yes please indicate that total bonus amount paid or expected to be paid for
the 2002 fishing year. \$ _____**Interviewer Note:** *All bonuses may not have been paid. Try to get an estimate even if they haven't been paid.***8.** Effort Management in the shrimp fishery**8.1** Use one of the following to describe your attitude toward each of the effort management programs listed in the table for the shrimp fishery.

Support: You would support the program for use in the shrimp fishery

Neutral or No Opinion.

Oppose: You would oppose the program for use in the shrimp fishery.

Definitions:

IFQ – Individual Fishing Quotas

TAC – Total Allowable Catch

IEQ – Individual Effort Quotas

Control Date - Date after which a vessel without a federal permit may not be assured
of future participation in the fishery should a limited entry program be
implemented in federal waters

A.	Establish a control date for permits. ____ Support ____ Neutral ____ Oppose
B.	Non-transferable Permit Limitation: There would be a limit on the number of vessels that could participate— initially permits would be limited to those who meet particular criteria. ____ Support ____ Neutral ____ Oppose

C.	<p>Permit Limitation: There would be a limit on the number of vessels that could participate— initially, permits would be limited to those who meet particular criteria. New entrants would have to buy their way into the fishery.</p> <p>____Support ____Neutral ____Oppose</p>
D.	<p>Total Catch Management System: Before the season began, fishery managers would determine a TAC. Catches would be reported regularly, and as total catch approached the TAC, managers would close the fishery.</p> <p>____Support ____Neutral ____Oppose</p>
E.	<p>Transferable Individual Fishing Quotas (IFQs): Participants with a history in the fishery would be assigned a percentage of the TAC and allowed to catch the resulting pounds of shrimp at times that were best for each vessel. Transferability of catch percentages would allow for fleet consolidation. New entrants would have to buy their way into the fishery.</p> <p>____Support ____Neutral ____Oppose</p>
F.	<p>Non-transferable Individual Fishing Quotas (IFQs): Participants with a history in the fishery would be assigned a percentage of the TAC and allowed to catch the resulting pounds of shrimp at times that were best for each vessel. No Transferability of catch percentages would be allowed.</p> <p>____Support ____Neutral ____Oppose</p>
G.	<p>Community Fishing Quotas: Communities with a history in the fishery would be assigned a percentage of the TAC. Each community would be allowed to catch the resulting pounds of shrimp at times that were best for each operation.</p> <p>____Support ____Neutral ____Oppose</p>
H.	<p>Non-Transferable Individual Effort Quotas (IEQs): Participants with a history in the fishery would be assigned a fixed number of effort units (fishing days for example). Each participant would be allowed to expend only that amount of effort, but could catch as much as possible within their effort limit.</p> <p>____Support ____Neutral ____Oppose</p>
I.	<p>Individual Effort Quotas: Participants with a history in the fishery would be assigned a fixed number of effort units (fishing days for example). Each participant would be allowed to expend only that amount of effort, but could catch as much as possible within their effort limit. Transferability of effort units would allow for fleet consolidation. New entrants would have to buy their way into the fishery.</p> <p>____Support ____Neutral ____Oppose</p>
J.	<p>Community Effort Quotas: Communities with a history in the fishery would be assigned a fixed number of effort units (fishing days for example). Each community would be allowed to expend only that amount of effort, but could catch as much as possible within their effort limit.</p> <p>____Support ____Neutral ____Oppose</p>

8.2 How would your support of IFQs change if quota collections were based on each vessel's fishing power or fishing capacity?

_____ More likely

_____ Less likely

8.3 How would your support of IEQs change if quota allocations were based on each vessel's fishing power or fishing capacity?

_____ More likely

_____ Less likely

Section II. Owner or Designee and Crewmember Demographics

This section collects demographic information about the Owner or Owner's designee and crewmembers. Reminder: Your individual responses will remain confidential.

9. Owner or Designee Information

9.1 Please indicate your age _____

9.2 Please indicate your marital status.

____Married ____Single ____Divorced ____Widowed
____Other (specify) _____

9.3 Please indicate the number of persons in your household (do not include paid borders/renters) _____

9.4 Please indicate the highest degree or level of school the owner has completed .

____No schooling completed	____High School Graduate (Diploma/GED)
____Nursery school to 4 th grade	____Some college credit, less than 1 year
____5 th or 6 th grade	____1 or more years of college, no degree
____7 th or 8 th grade	____Associate's degree (ex: AA, AS)
____9 th grade	____Bachelor's degree (ex: BA, AB, BS)
____10 th grade	____Master's degree (ex: MA, MS, MEng, MEd, MSW, MBA)
____11 th grade	____Professional degree (ex: MD, DDS, DVM, LLB, JD)
____12 th grade, No Diploma	____Doctorate degree (ex: PhD, EdD)

9.5 Are you Spanish/Hispanic/Latino?

____Yes ____No

Interviewer Note: *If the respondent indicates no, please go to the next question.*

If Yes, is the Owner Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

9.6 What is the race of the Owner: Check/specify one or more

<input type="checkbox"/> White	<input type="checkbox"/> Asian Indian
<input type="checkbox"/> Black, African American, or Negro	<input type="checkbox"/> Chinese
<input type="checkbox"/> American Indian or Alaska Native (Specify enrolled or principal tribe) _____	<input type="checkbox"/> Filipino
<input type="checkbox"/> Native Hawaiian	<input type="checkbox"/> Japanese
<input type="checkbox"/> Guamanian or Chamorro	<input type="checkbox"/> Korean
<input type="checkbox"/> Samoan	<input type="checkbox"/> Vietnamese
<input type="checkbox"/> Other Pacific Islander (Specify) _____	<input type="checkbox"/> Other Asian (Specify) _____
	<input type="checkbox"/> Other Race (Specify) _____

9.7 Do you speak a language other than English at home?

☐ Yes ☐ No

9.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

9.8 Please indicate your religious affiliation. Indicate none if not religious.

9.9 In addition to managing and/or operating this shrimp vessel, what other employment or work do you do? _____

Interviewer Note: *Interviewer should be certain not to include any other income earned on the vessel as specified in Question 6.2*

9.9.1 During which months of the year do you normally do this other work? _____

9.10 Please check the total income for your household.

<input type="checkbox"/> Less than \$10,000	<input type="checkbox"/> \$50,000 to \$74,999
<input type="checkbox"/> \$10,000 to \$14,999	<input type="checkbox"/> \$75,000 to \$99,999
<input type="checkbox"/> \$15,000 to \$24,999	<input type="checkbox"/> \$100,000 to \$149,999
<input type="checkbox"/> \$25,000 to \$34,999	<input type="checkbox"/> \$150,000 to \$199,999
<input type="checkbox"/> \$35,000 to \$49,999	<input type="checkbox"/> \$200,000 or more

10. Information about Crewmember Number 1

Interviewer Note: *The intent here is to get as much information about CURRENT crewmembers as possible from respondent. Do not attempt to get information directly from the crewmembers. In collecting this information the Interviewer should stress that the person providing the information should do so only if they are reasonably certain about the information.*

10.1 Position _____

10.2 Please indicate the approximate age of crewmember _____

10.3 If known, please indicate marital status of crewmember.

____Married ____Single ____Divorced ____Widowed
____Other (specify)_____ ____Unknown

10.4 If known, please indicate crewmember's level of education.

____Unknown ____Some College
____No High School Diploma ____College Graduate
____High School Graduate ____Graduate School

10.5 Is the crewmember Spanish/Hispanic/Latino?

____Yes ____No ____Unknown

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

10.6 What is the race of the crewmember: Check/specify one or more

____White	____Asian Indian
____Black, African American, or Negro	____Chinese
____American Indian or Alaska Native (Specify enrolled or principal tribe)_____	____Filipino
____Native Hawaiian	____Japanese
____Guamanian or Chamorro	____Korean

☐ Samoan☐ Vietnamese☐ Other Pacific Islander (Specify) _____☐ Other Asian (Specify) _____☐ Other Race (Specify) _____

10.7 If known, does the crewmember speak a language other than English at home?

☐ Yes☐ No☐ Unknown

10.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

10.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

11. Information about Crewmember Number 2**11.1** Position _____**11.2** Please indicate the approximate age of crewmember _____**11.3** If known, please indicate marital status of crewmember.☐ Married ☐ Single ☐ Divorced ☐ Widowed☐ Other (specify) _____ ☐ Unknown**11.4** If known, please indicate crewmember's level of education.☐ Unknown ☐ Some College☐ No High School Diploma ☐ College Graduate☐ High School Graduate ☐ Graduate School**11.5** Is the crewmember Spanish/Hispanic/Latino?☐ Yes ☐ No ☐ Unknown

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

11.6 What is the race of the crewmember: Check/specify one or more☐ White ☐ Asian Indian☐ Black, African American, or Negro ☐ Chinese☐ American Indian or Alaska Native (Specify
enrolled or principal tribe) _____ ☐ Filipino☐ Native Hawaiian ☐ Japanese☐ Guamanian or Chamorro ☐ Korean☐ Samoan ☐ Vietnamese☐ Other Pacific Islander (Specify) _____ ☐ Other Asian (Specify) _____☐ Other Race (Specify) _____

11.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

11.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

11.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

12. Information about Crewmember Number 3**12.1** Position _____**12.2** Please indicate the approximate age of crewmember _____**12.3** If known, please indicate marital status of crewmember.

____Married ____Single ____Divorced ____Widowed

____Other (specify)_____ ____Unknown

12.4 If known, please indicate crewmember's level of education.

____Unknown ____Some College

____No High School Diploma ____College Graduate

____High School Graduate ____Graduate School

12.5 Is the crewmember Spanish/Hispanic/Latino?

____Yes ____No ____Unknown

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

12.6 What is the race of the crewmember: Check/specify one or more

____White ____Asian Indian

____Black, African American, or Negro ____Chinese

____American Indian or Alaska Native (Specify
enrolled or principal tribe)_____ ____Filipino

____Native Hawaiian ____Japanese

____Guamanian or Chamorro ____Korean

____Samoan ____Vietnamese

____Other Pacific Islander (Specify)_____ ____Other Asian (Specify) _____

____Other Race (Specify) _____

12.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

12.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

12.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

13. Information about Crewmember Number 4**13.1** Position _____**13.2** Please indicate the approximate age of crewmember _____**13.3** If known, please indicate marital status of crewmember.☐ Married ☐ Single ☐ Divorced ☐ Widowed☐ Other (specify) _____ ☐ Unknown**13.4** If known, please indicate crewmember's level of education.☐ Unknown ☐ Some College☐ No High School Diploma ☐ College Graduate☐ High School Graduate ☐ Graduate School**13.5** Is the crewmember Spanish/Hispanic/Latino?☐ Yes ☐ No ☐ Unknown

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

13.6 What is the race of the crewmember: Check/specify one or more☐ White ☐ Asian Indian☐ Black, African American, or Negro ☐ Chinese☐ American Indian or Alaska Native (Specify
enrolled or principal tribe) _____ ☐ Filipino☐ Native Hawaiian ☐ Japanese☐ Guamanian or Chamorro ☐ Korean☐ Samoan ☐ Vietnamese☐ Other Pacific Islander (Specify) _____ ☐ Other Asian (Specify) _____☐ Other Race (Specify) _____

13.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

13.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

13.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

14. Information about Crewmember Number 5**14.1** Position _____**14.2** Please indicate the approximate age of crewmember _____**14.3** If known, please indicate marital status of crewmember.☐ Married ☐ Single ☐ Divorced ☐ Widowed☐ Other (specify) _____ ☐ Unknown**14.4** If known, please indicate crewmember's level of education.☐ Unknown ☐ Some College☐ No High School Diploma ☐ College Graduate☐ High School Graduate ☐ Graduate School**14.5** Is the crewmember Spanish/Hispanic/Latino?☐ Yes ☐ No ☐ Unknown

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

14.6 What is the race of the crewmember: Check/specify one or more☐ White ☐ Asian Indian☐ Black, African American, or Negro ☐ Chinese☐ American Indian or Alaska Native (Specify
enrolled or principal tribe) _____ ☐ Filipino☐ Native Hawaiian ☐ Japanese☐ Guamanian or Chamorro ☐ Korean☐ Samoan ☐ Vietnamese☐ Other Pacific Islander (Specify) _____ ☐ Other Asian (Specify) _____☐ Other Race (Specify) _____

14.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

14.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

14.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

15. Information about Crewmember Number 6**15.1** Position _____**15.2** Please indicate the approximate age of crewmember _____**15.3** If known, please indicate marital status of crewmember.

____Married ____Single ____Divorced ____Widowed

____Other (specify)_____ ____Unknown

15.4 If known, please indicate crewmember's level of education.

____Unknown ____Some College

____No High School Diploma ____College Graduate

____High School Graduate ____Graduate School

15.5 Is the crewmember Spanish/Hispanic/Latino?

____Yes ____No ____Unknown

If Yes, is the crewmember Mexican, Mexican Am., Chicano: _____

Or Puerto Rican: _____

Or Cuban: _____

Or Other Spanish/Hispanic/Latino (specify) _____

15.6 What is the race of the crewmember: Check/specify one or more

____White ____Asian Indian

____Black, African American, or Negro ____Chinese

____American Indian or Alaska Native (Specify
enrolled or principal tribe)_____ ____Filipino

____Native Hawaiian ____Japanese

____Guamanian or Chamorro ____Korean

____Samoan ____Vietnamese

____Other Pacific Islander (Specify)_____ ____Other Asian (Specify) _____

____Other Race (Specify) _____

15.7 If known, does the crewmember speak a language other than English at home?
_____Yes _____No _____Unknown

15.7.1 If yes, what is this language? (For example: Korean, Italian, Spanish, Vietnamese) _____

15.8 If known, please indicate the crewmember's religion. Indicate none if not religious, and unknown if you are not reasonably certain. _____

Development of a Sampling Plan for Socioeconomic Survey of Offshore Gulf Shrimp Fishermen

Mark S. Kaiser

Department of Statistics, Iowa State University

December 2002

1 Introduction

This report has been prepared for the Marine Resources Assessment Group, Americas (MRAG), using data on the characteristics of the offshore gulf shrimp fleet that have primary landings sites in Texas (data provided through MRAG by Mike Travis, NMFS). Data on characteristics of the fleet were compiled by merging information from the US Coast Guard on registered vessels with NFMS information from a Gulf-wide shrimp dealer reporting program. The number of vessels for which such data exist is 1,207, and this is taken as the fixed, known size of the population of interest in this report. The data contain values for a number of physical characteristics of each vessel, such as age, length, and tonnage, and two measures of activity in 2001, total shrimp catch (Gulf only) and gross revenue.

The purpose of the survey to be conducted is to collect information on socioeconomic characteristics of the offshore fleet, with an emphasis on costs incurred and investments made at the level of individual vessels. It has been determined by NMFS that the survey will consist of about 10% of the total population, and it is strongly believed that some stratification of the population should be used to ensure coverage of various sectors that may exist in the fleet (e.g., small versus large vessels) and possibly improve efficiency (i.e., reduce variances) of the resulting estimators of population values. At this time, however, it has not been determined which, if any, characteristics of vessels for which data are available might be directly related to the response variables of interest in the survey.

This report develops a sampling and estimation strategy that may be used to provide both point and interval estimates of fleet-wide total and average values for responses of interest in the planned survey. The basic approach is that of *post-stratification*, but this is combined with a highly stratified initial sample designed to provide coverage of all sectors of the fleet relative to geographic location of pri-

mary port, size of vessel, and activity in 2001. While poststratified estimates are certainly valid in their own right, gains in efficiency may be realized if fixed stratification is employed in future years, and the design proposed here lends itself to the identification of useful strata for future use.

2 The Concept of Poststratification

Sampling plans having fixed strata for both the sample design and estimation in a survey are generally used in situations for which population units within the population may be classified into relatively homogeneous groups (i.e., strata), where homogeneous means with respect to the response of interest. If the variance in responses is smaller within strata than between strata, it is often possible to realize an increase in efficiency of a population-level estimator relative to that of a simple random sample; efficiency here refers to the mean squared error or variance of estimators, which are equal under unbiased estimation. In some situations, however, it is difficult or undesirable to designate strata at the sample design phase, even though the use of stratified estimation procedures may be appropriate. For example, strata definitions may be readily available, but obtaining a sample using some other plan, such as simple random sampling, may be less costly or more easily accomplished. A similar situation arises when a survey includes multiple responses of interest, and a single stratified sample design may not be appropriate for all of the responses. In such situations the typical statistical approach to estimation is called *poststratification*. The essence of poststratification is to classify sampled units into strata classes *after* the sample is collected, then perform estimation as if these strata had been used to design the sampling procedure in the first place. While this is certainly the concept behind poststratification, there are some differences with a fixed stratification procedure that should not be ignored.

The fundamental difference between a fixed stratification scheme and the use of poststratification is that, in the former, the size of samples taken from various strata are fixed prior to selection of a sample while, in the latter, the size of samples within (post) strata are random quantities. This leads to differences in the variance of estimators of population quantities under fixed stratified and poststratified estimation procedures. There are two of these differences that deserve mention here. First, the variance of poststratified estimators includes a source of variability, due to the fact that sample sizes within strata are random, that is not present in fixed stratification schemes. This source of variability is often ignored in poststratified estimation, which is then conducted *conditionally* on the realized strata sample sizes (e.g., Thompson, 1992; page 109). The second difference is more subtle and, perhaps, more important. In a fixed stratification scheme, independent estimates are available for individual strata, and these estimates may then be simply combined to population-level estimates. In poststratification, however, estimates of strata-level quantities (e.g., totals or means) are typically not independent among strata and, thus, are not easily combined to the population level. Two types of estimators are proposed in this report, one that provides unbiased estimates of poststrata totals, means, and their variances, and the other that provides more efficient estimates at the level of the entire population.

Poststratification estimators are most commonly presented in the sampling literature under the assumption that the sample (sometimes called the *parent* sample) is obtained through a simple random sampling design. This assumption is appropriate for situations in which obtaining a sample drawn from fixed strata is logistically difficult relative to obtaining a sample from a simple random sampling design. The problem considered here, however, is somewhat different in that it is not implementation of a sampling design that is problematic but, rather, the identification of appropriate strata from a number of possibilities. In addition, given the focus of

the survey on the fixed and variable costs of shrimping, it is desirable to draw an initial sample that ensures reasonable coverage of the entire fleet relative to characteristics that might be connected to costs. Thus, what is recommended in this report is the use of poststratification estimators combined with a structured initial sampling design. This renders the resulting statistical estimators somewhat more complex than what is typically found in elementary sampling texts (e.g., Thompson, 1992). It is the intent of this report to give sufficient detail to allow the estimation strategy recommended to be readily understood, but (hopefully) without belaboring well-known results from elementary theory.

3 Fundamental Approach and Notation

The statistical approach adopted in this report is one in which probability is generated only through the sampling mechanism. That is, responses on observed population units are not interpreted as realizations of random variables but, rather, as fixed characteristics of those units. Thus, in the notation that follows, y_k represents a non-random characteristic of the k th unit of the population, the response of the k th unit. The population is taken to consist of a total of N units; in this report we have $N = 1,207$. Probability is applied to the chances that units of the population are included in a sample. This probability will be represented in terms of *indicator* variables,

$$I(k \in \mathcal{S}) = \begin{cases} 1 & \text{if unit } k \text{ is in sample } \mathcal{S} \\ 0 & \text{otherwise.} \end{cases}$$

Using this notation, the indicator variables $\{I(k \in \mathcal{S})\}$ are binary random quantities with expected value equal to the probability that the k th unit is selected for the sample,

$$E\{I(k \in \mathcal{S})\} = \pi_k. \tag{1}$$

In this notation, the quantities $\{\pi_k; k = 1, \dots, N\}$ are called the *inclusion probabilities* for the population units.

Under the assumption that a sample of size n is to be drawn without replacement, so that a unit may not appear more than once in the sample, the inclusion probabilities are not independent. In particular, the probability that two particular units, k and j say, are both included in the sample is not equal to the product $\pi_k \pi_j$. For this reason we define the *second order inclusion probabilities* as,

$$E\{I(k \in \mathcal{S}) I(j \in \mathcal{S})\} = \pi_{k,j}. \quad (2)$$

The second order inclusion probabilities will become important in determining the variances associated with possible estimators.

The sample is to be drawn from the entire population U as a stratified sample, where the strata will be defined as groups of population units that are denoted with the subscript h ; $h = 1, \dots, H$. That is, U_h will denote the *hth sampling stratum*, $U_h \equiv \{k : k \in \text{stratum } h\}$, the set of units in the population that fall into the *hth* group, N_h will denote the number of population units in the *hth* sampling stratum, \mathcal{S}_h the sample from the *hth* sampling stratum, n_h the number of units in the sample from the *hth* sampling stratum, and so forth. Thus, the summation

$$\sum_{k \in \mathcal{S}_h} y_k$$

denotes the sum of the responses y_k over the units that are selected for the sample from the *hth* sampling stratum.

For estimation under a given poststratification scheme, we will let U_g ; $g = 1, \dots, G$ denote the *analysis strata*. Subscripting for these strata will follow the same conventions as for the sample strata described immediately above. Note that both the sampling strata $\{U_h : h = 1, \dots, H\}$ and the analysis strata $\{U_g : g = 1, \dots, G\}$ constitute partitions of the population, but partitions that may overlap in a complex manner. For example, the *2nd* analysis stratum may be composed of parts of

the 1st, 3rd, and 5th sampling strata. This requires double subscripting of various quantities such as $U_{g,h}$ for the set of units in the g th analysis stratum that are also in the h th sampling stratum, $N_{g,h}$ for the number of such units, $\mathcal{S}_{g,h}$ for the set of sampled units in the g th analysis stratum and h th sampling stratum, $n_{g,h}$ for the number of such units, and so forth. An important mechanism that will be used repeatedly is that, for any quantity associated with population units, x_k say,

$$\sum_{k \in U_g} x_k = \sum_{h=1}^H \sum_{k \in U_{g,h}} x_k.$$

It is assumed that the objective is to estimate either the total or mean of a given response in the population, and these will be denoted as τ and μ , respectively. That is,

$$\begin{aligned} \tau &\equiv \sum_{k \in U} y_k, \\ \mu &\equiv \frac{1}{N} \sum_{k \in U} y_k. \end{aligned}$$

4 Drawing a Comprehensive Sample

An extensive exploratory analysis was conducted using data provided by NMFS that contained values for tonnage, length, and age of vessels registered by the US Coast Guard, total gulf shrimp pounds landed (2001) and gross revenue (2001) for these same vessels. Summary statistics, marginal histograms, and other quantities were examined for these variables. A complete presentation and discussion of this exploratory work would render this report untimely and is thus not presented here. Two figures resulting from these analyses bear presentation. Figure 1 presents a scatterplot matrix of the variables mentioned above for the entire set of 1,207 vessels (except for plots that involve age of vessel for which there are only 1,205 vessels represented due to missing values for age). It is evident that, aside from ton-

nage versus length and landed pounds versus gross revenue, relations among these variables are weak. In particular, the scatterplot of total pounds of landed shrimp versus vessel tonnage (fourth row down from the top in the first column of Figure 1) demonstrates that large size of vessel is perhaps necessary for a high level of shrimp catch, but is not sufficient for the same. The relation between total landed pounds and gross revenue (both for 2001) is particularly interesting, and a larger perspective of this relation is shown in the scatterplot of Figure 2. In Figure 2 it can be seen that, while there is a strong linear relation between these variables, which might be expected, there are also more vessels that appear to have a smaller gross revenue than the bulk of the fleet that landed a comparable number of pounds of shrimp than there are vessels that obtained a larger gross revenue than the bulk of the comparable fleet. Identification of the data points that corresponded to vessels having particular primary ports did not reveal any identifiable patterns relative to this scatterplot (i.e., all of the “low” points did not correspond to one or a few particular ports). Nevertheless, this interesting relation led to the idea that vessels might be stratified, for sampling purposes, based on whether they realized above average revenue for the total shrimp landed or below average revenue for the total shrimp landed, where average refers to the entire fleet.

Two additional factors were identified as primary candidates to define sampling strata, those being vessel tonnage and primary port. Vessels in the fleet range from 5 to 232 tons, and geographic location of primary port may reasonably be related to level of variable costs, such as the price of fuel and ice. While there is no numerical evidence that either of these factors is related to the response variables of interest in a survey of socioeconomic characteristics of the fleet, they seem to represent the most easily identifiable categories that might be claimed as “under-represented” if one was not pleased with the results of the survey to be conducted.

The recommended sampling stratification consists of 12 ports, two vessel sizes

(based on tonnage), and two “economic return” categories (above and below average for the given total landings), for a total of 48 sampling strata. Vessel size was defined as “small” if tonnage was less than 100 and “large” if tonnage was greater than 100, these values based on the marginal histogram for tonnage of all vessels in the fleet. Ports 71 (Chambers County), 83 (Port Lavaca), 84 (Harris County), and 86 (Matagorda County) had all four sub-categories collapsed into one due to small numbers of vessels with these as primary ports, and port 72 (Galveston) had small and large vessels for larger than average economic return collapsed into one category for the same reason. This results in a total of 34 sampling strata, which are indexed and identified in Table 1. The division of “economic return” as + and – was based on positive and negative residuals from an ordinary least squares fit of gross revenue to total pounds of shrimp landed.

It is suggested that the sampling plan be that of a stratified random sample using proportional allocation with the 34 sampling strata identified. Since the total number of population units is $N = 1,207$, a sample of 10% of the population is $n = 121$. Allocations proportional to population size in the strata N_h yields the fixed sample sizes n_h listed in Table 1. Also given in Table 1 are the inclusion probabilities from equation (1) and the second-order inclusion probabilities from equation (2). Using simple random sampling within each of the 34 strata presented in Table 1, the inclusion probabilities are computed, for $k \in U_h$, as

$$\pi_k = \frac{(N_h - 1)!}{(n_h - 1)! ((N_h - 1) - (n_h - 1))!} = \frac{n_h}{N_h},$$

while the second-order inclusion probabilities are computed for $k, j \in U_h$; $k \neq j$, as

$$\pi_{k,j} = \frac{(N_h - 2)!}{(n_h - 2)! ((N_h - 2) - (n_h - 2))!} = \frac{n_h(n_h - 1)}{N_h(N_h - 1)}.$$

Table 1. Definition of Sampling Strata

Statum id (h)	Port	Economic Return	Size	N_h	n_h	π_k	$\pi_{k,j}$
1	70	+	Small	12	1	0.0833	0.0000
2	70	+	Large	103	10	0.0971	0.0086
3	70	−	Small	77	8	0.1039	0.0096
4	70	−	Large	52	5	0.0962	0.0075
5	71	All	All	10	1	0.1000	0.0000
6	72	+	All	19	2	0.1053	0.0058
7	72	−	All	24	2	0.0833	0.0036
8	73	+	Small	8	1	0.1250	0.0000
9	73	+	Large	20	2	0.1000	0.0053
10	73	−	Small	32	3	0.0938	0.0060
11	73	−	Large	54	5	0.0926	0.0070
12	78	+	Small	24	2	0.0833	0.0036
13	78	+	Large	23	2	0.0870	0.0039
14	78	−	Small	42	4	0.0954	0.0070
15	78	−	Large	9	1	0.1111	0.0000
16	81	+	Small	25	3	0.1200	0.0100
17	81	+	Large	51	5	0.0980	0.0078
18	81	−	Small	35	4	0.1143	0.0101
19	81	−	Large	37	4	0.1081	0.0090
20	82	+	Small	29	3	0.1034	0.0074
21	82	+	Large	105	11	0.1048	0.0101
22	82	−	Small	28	3	0.1071	0.0079
23	82	−	Large	34	3	0.0882	0.0053
24	83	All	All	23	2	0.0870	0.0040
25	84	All	All	12	1	0.0833	0.0000

Table 1 (cont.)

26	85	+	Small	11	1	0.0909	0.0000
27	85	+	Large	13	1	0.0769	0.0000
28	85	–	Small	75	8	0.1067	0.0101
29	85	–	Large	38	4	0.1053	0.0085
30	86	All	All	17	2	0.1176	0.0074
31	87	+	Small	16	2	0.1250	0.0083
32	87	+	Large	69	7	0.1014	0.0090
33	87	–	Small	27	3	0.1111	0.0085
34	87	–	Large	53	5	0.0943	0.0073
TOTAL	ALL	ALL	ALL	1207	121		

To draw a stratified random sample according to the prescription of Table 1, a simple random sample of size n_h is taken from each of the 34 strata. A file giving classification of vessels into these strata is available, but is not presented here for reasons of confidentiality.

5 Estimation

Two types of estimators for totals and mean responses are presented in this section. Both depend heavily on the inclusion and second-order inclusion probabilities presented in Table 1 for the suggested sampling design of Section 4. The estimators presented in Section 5.1 are known as Horvitz-Thompson estimators. They provide unbiased estimates for any set of groups, but are difficult to combine to the population level in this situation, because estimates of the group variances are not independent under poststratification. It is recommended that these estimators be used to examine individual sectors (groups) of the fleet, those sectors corresponding

to various poststrata. This should provide information about the relative homogeneity of groups that might be used as strata in the future. The estimators presented in Section 5.2 are derived from what are known as regression estimators. These estimators are not unbiased, but are generally felt to possess smaller mean squared (or total) error than the corresponding Horvitz-Thompson estimators. It is recommended that these estimators be used to examine quantities at the level of the total fleet under various poststratification schemes.

Given the definitions of π_k and $\pi_{k,j}$ in equations (1) and (2), respectively, we have that

$$\begin{aligned} \text{var}\{I(k \in \mathcal{S})\} &= \pi_k(1 - \pi_k); \quad k \in U \\ \text{cov}\{I(k \in \mathcal{S}), I(j \in \mathcal{S})\} &= \pi_{k,j} - \pi_k\pi_j; \quad k, j \in U; \quad k \neq j \end{aligned}$$

Recall in what follows that $h = 1, \dots, H$ is used to index the sampling strata, while $g = 1, \dots, G$ is used to index the analysis strata, or poststrata.

5.1 The Horvitz-Thompson Estimator

A well-known result from the theory of survey sampling is that, for any population (or group within a population), an unbiased estimator of the total response is the standard Horvitz-Thompson estimator,

$$\hat{\tau} = \sum_{k \in \mathcal{S}} \frac{y_k}{\pi_k}. \quad (3)$$

The proof of unbiasedness for this estimator is given here to illustrate a technique that will be used repeatedly in subsequent results. Note that, using the indicator variable notation, from Section 2, we can write (3) as

$$\hat{\tau} = \sum_{k \in U} \frac{y_k}{\pi_k} I(k \in \mathcal{S}).$$

Then,

$$\begin{aligned}
 E\{\hat{\tau}\} &= E\left\{\sum_{k \in U} \frac{y_k}{\pi_k} I(k \in \mathcal{S})\right\} \\
 &= \sum_{k \in U} \frac{y_k}{\pi_k} E\{I(k \in \mathcal{S})\} \\
 &= \sum_{k \in U} \frac{y_k}{\pi_k} \pi_k = \sum_{k \in U} y_k = \tau
 \end{aligned}$$

Since the above result holds for any arbitrary group of population units, we may apply the Horvitz-Thompson estimator to poststratification groups. To do this requires the recognition that not all π_k are identical for a given level of the group indicator g . That is,

$$\hat{\tau}_g = \sum_{k \in \mathcal{S}_g} \frac{y_k}{\pi_k} = \sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k}{\pi_k} = \sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k N_h}{n_h}. \quad (4)$$

That $\hat{\tau}_g$ is unbiased for τ_g follows from the fact that unbiasedness of $\hat{\tau}$ in (3) holds for any group, or may be shown directly using the same method applied to $\hat{\tau}$ above. Note that $\hat{\tau}_g$ may be written as,

$$\hat{\tau}_g = \sum_{k \in U_g} \frac{y_k}{\pi_k} I(k \in \mathcal{S}_g) = \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} I(k \in \mathcal{S}_{g,h}).$$

Then,

$$\begin{aligned}
 E\{\hat{\tau}_g\} &= E\left\{\sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} I(k \in \mathcal{S}_{g,h})\right\} \\
 &= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} E\{I(k \in \mathcal{S}_{g,h})\} \\
 &= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k N_h}{n_h} \frac{n_h}{N_h} = \sum_{h=1}^H \sum_{k \in U_{g,h}} y_k = \tau_g.
 \end{aligned}$$

The variance of $\hat{\tau}_g$ in (4) is derived as,

$$\begin{aligned}
\text{var}\{\hat{\tau}_g\} &= \text{var}\left\{\sum_{k \in U_g} \frac{y_k}{\pi_k} I(k \in \mathcal{S}_g)\right\} \\
&= \sum_{k \in U_g} \frac{y_k^2}{\pi_k^2} \text{var}\{I(k \in \mathcal{S}_g)\} + \sum_{k,j \in U_g; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} \text{cov}\{I(k \in \mathcal{S}_g), I(j \in \mathcal{S}_g)\} \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2}{\pi_k^2} \text{var}\{I(k \in \mathcal{S}_{g,h})\} + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} \text{cov}\{I(k \in \mathcal{S}_{g,h}), I(j \in \mathcal{S}_{g,h})\},
\end{aligned}$$

where the last line follows because any two population units k and j that are not in the same sampling stratum h have second-order inclusion probability $\pi_{k,j} = \pi_k \pi_j$, and then $\text{cov}\{I(k \in \mathcal{S})\}, I(j \in \mathcal{S})\} = 0$. Then,

$$\begin{aligned}
\text{var}\{\hat{\tau}_g\} &= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2}{\pi_k^2} \text{var}\{I(k \in \mathcal{S}_{g,h})\} + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} \text{cov}\{I(k \in \mathcal{S}_{g,h}), I(j \in \mathcal{S}_{g,h})\} \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2}{\pi_k^2} \pi_k (1 - \pi_k) + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j}{\pi_k \pi_j} (\pi_{k,j} - \pi_k \pi_j) \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2 N_h^2}{n_h^2} \frac{n_h}{N_h} \left(1 - \frac{n_h}{N_h}\right) + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} \frac{y_k y_j N_h^2}{n_h^2} \left\{ \frac{n_h(n_h - 1)}{N_h(N_h - 1)} - \frac{n_h^2}{N_h^2} \right\} \\
&= \sum_{h=1}^H \sum_{k \in U_{g,h}} \frac{y_k^2 N_h}{n_h} \left(1 - \frac{n_h}{N_h}\right) + \sum_{h=1}^H \sum_{k,j \in U_{g,h}; k \neq j} y_k y_j \left\{ \frac{N_h(n_h - 1)}{(N_h - 1)n_h} - 1 \right\} \\
&= \sum_{h=1}^H \left(\frac{N_h - n_h}{n_h} \right) \sum_{k \in U_{g,h}} y_k + \sum_{h=1}^H \left(\frac{n_h - N_h}{n_h(N_h - 1)} \right) \sum_{k,j \in U_{g,h}; k \neq j} y_k y_j. \tag{5}
\end{aligned}$$

An unbiased estimator of $\text{var}\{\hat{\tau}_g\}$ is obtained as,

$$\begin{aligned}
\hat{V}\{\hat{\tau}_g\} &= \sum_{h=1}^H \left(\frac{N_h - n_h}{n_h} \right) \sum_{k \in S_{g,h}} \frac{y_k N_h}{n_h} + \sum_{h=1}^H \left(\frac{n_h - N_h}{n_h(N_h - 1)} \right) \sum_{k,j \in S_{g,h}; k \neq j} \frac{y_k y_j N_h(N_h - 1)}{n_h(n_h - 1)} \\
&= \sum_{h=1}^H \left(\frac{(N_h - n_h)N_h}{n_h^2} \right) \sum_{k \in S_{g,h}} y_k + \sum_{h=1}^H \left(\frac{(n_h - N_h)N_h}{n_h^2(n_h - 1)} \right) \sum_{k,j \in S_{g,h}; k \neq j} y_k y_j, \tag{6}
\end{aligned}$$

that is, by substituting into (5) unbiased estimators of the two quantities

$$\sum_{k \in U_{g,h}} y_k \quad \text{and} \quad \sum_{k,j \in U_{g,h}; k \neq j} y_k y_j.$$

For estimation of postrata means, we make use of the fact that $\tau_g = N_g \mu_g$. To estimate the mean response, rather than the total, for group g , divide $\hat{\tau}_g$ in equation (4) by the known group size N_g , that is, $\hat{\mu}_g = \hat{\tau}_g / N_g$. The variance and estimated variance of $\hat{\mu}_g$ are computed by dividing equations (5) and (6) by N_g^2 , that is, $\text{var}\{\hat{\mu}_g\} = \text{var}\{\hat{\tau}_g\} / N_g^2$ and $\hat{V}\{\hat{\mu}_g\} = \hat{V}\{\hat{\tau}_g\} / N_g^2$.

5.2 Regression Estimator

Development of the general regression estimator under poststratification for the case in which the sample is itself selected from a stratified sampling plan is not as straightforward as the simple calculations connected with the Horvitz-Thompson estimators of Section 5.1. A complete development may be found in Sarndal, Swenson and Wretman, 1992, particularly Chapters 6 and 7. Using the same notation as in previous sections, a regression estimator of the population total may be written as,

$$\begin{aligned} \hat{\tau} &= \sum_{g=1}^G N_g \frac{\sum_{k \in \mathcal{S}_g} y_k / \pi_k}{\sum_{k \in \mathcal{S}_g} 1 / \pi_k} \\ &= \sum_{g=1}^G N_g \frac{\sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} (y_k N_h) / n_h}{\sum_{h=1}^H \sum_{k \in \mathcal{S}_{g,h}} (n_{g,h} N_h) / n_h}. \end{aligned} \quad (7)$$

The variance and estimated variance for $\hat{\tau}$ from (7) is perhaps presented most easily by noting that

$$\hat{\tau} = \sum_{g=1}^G N_g \frac{\sum_{h=1}^H \hat{\tau}_{g,h}}{\sum_{h=1}^H \hat{N}_{g,h}} = \sum_{g=1}^G N_g \frac{\hat{\tau}_g}{\hat{N}_g}, \quad (8)$$

where,

$$\hat{\tau}_{g,h} = \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k}{\pi_k} = \sum_{k \in \mathcal{S}_{g,h}} \frac{y_k N_h}{n_h},$$

and

$$\hat{N}_{g,h} = \sum_{k \in \mathcal{S}_{g,h}} \frac{1}{\pi_k} = \sum_{k \in \mathcal{S}_{g,h}} \frac{N_h}{n_h}.$$

Using this notation, a first-order Taylor's series approximation to $\hat{\tau}$, and derivation of the variances for components in this linearization (see Wolter, 1985) yields,

$$var\{\hat{\tau}\} \approx \sum_{g=1}^G \sum_{k \in U_g} \pi_k (1 - \pi_k) \frac{(y_k - \tau_g/N_g)^2}{\pi_k^2} + \sum_{g=1}^G \sum_{g'=1}^G \sum_{k \in U_g; j \in U_{g'}; k \neq j} (\pi_{k,j} - \pi_k \pi_j) \left(\frac{y_k - \tau_g}{\pi_k} \right) \left(\frac{y_j - \tau_{g'}}{\pi_j} \right). \quad (9)$$

This approximate variance may be estimated by substitution of the estimators $\hat{\tau}_g$ and \hat{N}_g appearing in expression (8) for the corresponding quantities τ_g and N_g in (9). The expressions for $var\{\hat{\tau}\}$ and its estimated value can be further expressed in terms of N_h and n_h as has been shown previously for other estimators, but this is not shown in the current report.

6 Non-Response and Voluntary Responses

It is anticipated that both non-response and voluntary responses will occur in the planned survey of shrimp fishermen in the gulf. Suggested strategies for dealing with these potential difficulties are stated briefly here. Non-response refers to vessels selected for the sample that refuse to give information. Voluntary response refers to individuals who provide information even though their vessel was not selected for the sample.

1. Non-Response.

Although any number of statistical approaches might be applied to missing

responses, such as adjustment of estimators, hot-deck imputation, or multiple imputation, development of these approaches is beyond the scope of the current project. An alternative, which might be justified for this survey, would be to simply remove units from the population of interest if those units refuse to provide information. This might require re-computation of inclusion probabilities after it is known how many sampled vessels have refused to cooperate, but otherwise provides no additional difficulties for the methodology proposed in this report.

2. Voluntary Responses.

Voluntary responses are easily incorporated into the estimators proposed in this report by setting inclusion probabilities equal to one. That is, for any vessel w represented by submission of an unsolicited response to the survey, $\pi_w \equiv 1$. Second-order inclusion probabilities involving vessel w are computed using independence among voluntary responses and solicited responses (i.e., sampled vessels) as $\pi_{w,j} = \pi_w \pi_j$ for any $j \neq w$. Such responses may then be directly incorporated into all of the estimators presented in previous sections.

References

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- Thompson, S.K. (1992), *Sampling*. New York: John Wiley and Sons.
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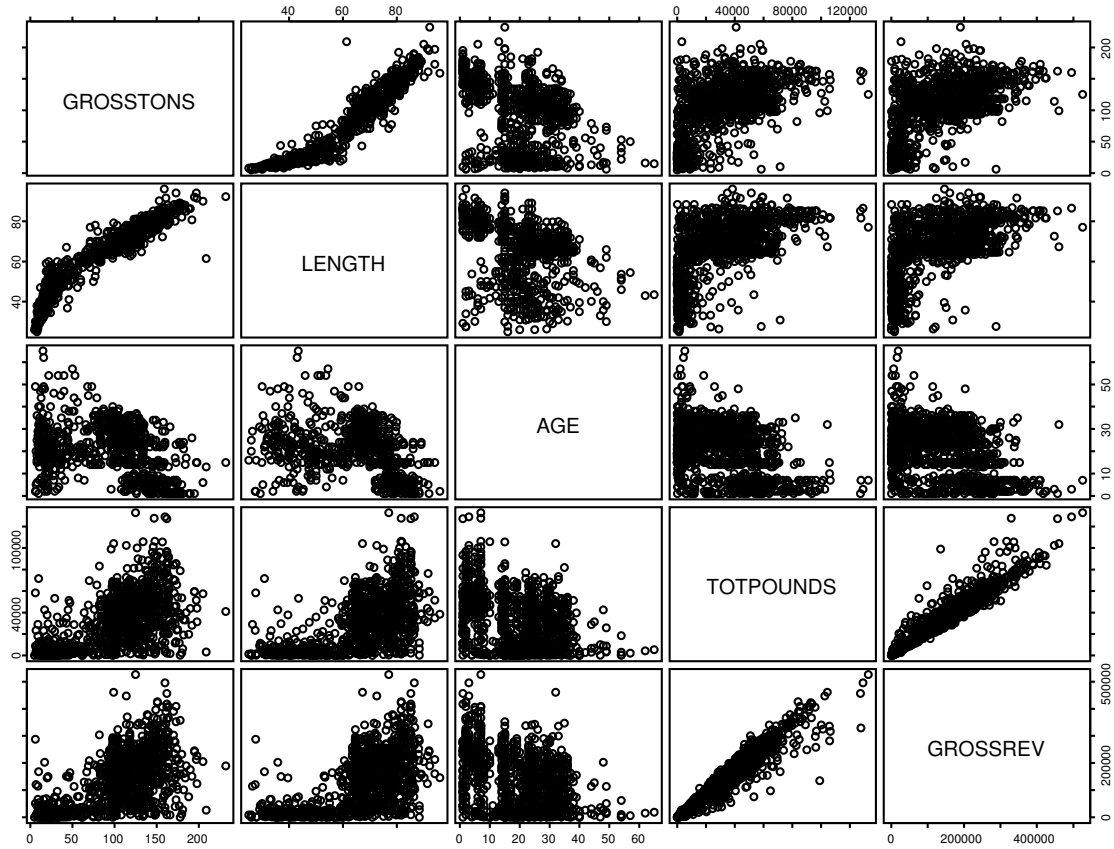


Figure 1. Scatterplot matrix of variables included in the vessel characteristics data provided by NMFS.

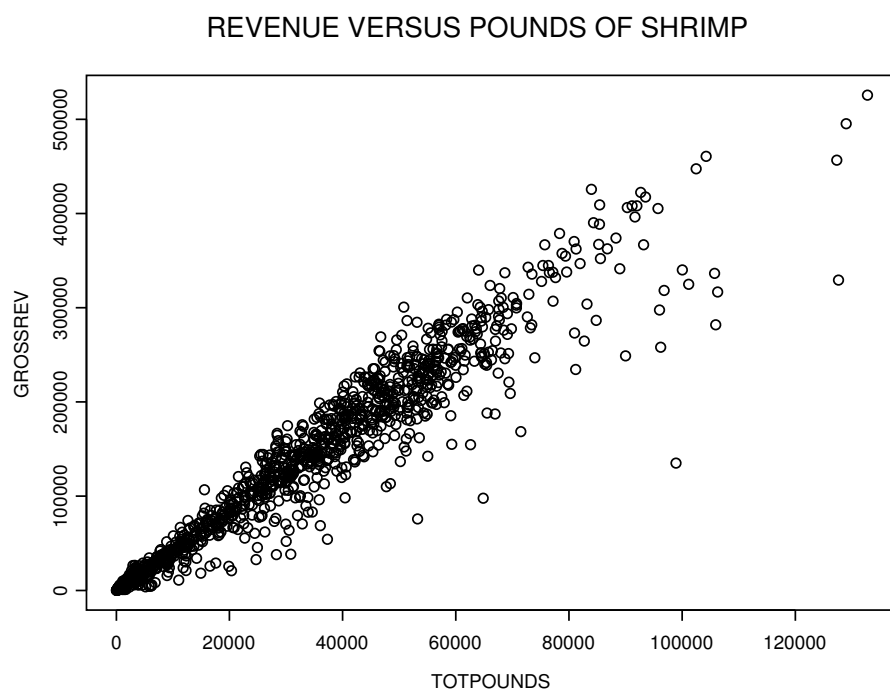


Figure 2. Scatterplot of gross revenue for vessels versus total pounds of shrimp landed.
Both numbers are for 2001.

Addendum to Development of a Sampling Plan for
Socioeconomic Survey of Offshore Gulf Shrimp
Fishermen:
Production of Random Samples and Adjustments
for Nonresponse

Mark S. Kaiser

Department of Statistics, Iowa State University

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1 Introduction

This report has been prepared for the Marine Resources Assessment Group, Americas (MRAG), as part of a project on the design of a survey of shrimp fishermen on the Gulf Coast. A previous report described a sampling and analysis plan for this project that relied on a highly stratified sampling design combined with the use of *post-stratification* for estimation of quantities of interest in the population. After the sample has been selected, the stratification used in its production is ignored, resulting in what can be considered simply an unequal probability sample across the population. The individual *inclusion probabilities* that result play a key role in any subsequent analyses.

Two inter-related issues, mentioned only briefly in the previous report, seem to have caused some confusion, and the purpose of this addendum is to clarify these issues. The subjects of concern may be described as *sequential versus group sample selection* and *adjustment for nonresponse*. Briefly, one recommendation given in the previous report was that, given a properly constructed sampling list, samples of any desired size could be selected and, in particular, sample size could be increased at any time, simply by selecting additional units from the list. This prescription may have been misinterpreted at some level within NMFS or OMB. In addition, it was suggested that one potential mechanism for dealing with the difficult problem of nonresponse would be to “re-define” the population of interest as excluding units who refused to respond. This was suggested as a simple and practical approach to avoid the potential deleterious effects of nonresponse bias, but would require a re-computation of inclusion probabilities for units that did respond. The approach is not entirely satisfactory because it leaves units in the population that would have refused to respond had they been chosen for the sample. In addition, it appears that NMFS is either unwilling or unable under regulations to re-define the population

in this manner. Thus, some type of adjustment is necessary to account for non-response. These two issues are inter-related because the desire to increase sample size is directly related to the number of non-responses encountered in an original sample.

2 Equivalence of Sequential and Group Sampling

This section demonstrates the equivalence of group and sequential sampling methods for selecting a simple random sample of size n from a population of size N . Since the sampling plan proposed in the earlier report involves selection of a simple random sample from a number of groups or “sampling strata”, this result is directly applicable to that situation.

Consider the process of selecting a simple random sample of n units from a population that contains N units. By definition, this implies that each possible sample of size n has the same probability of being selected. Denote a possible sample of size n as $S_{n,k}$. The number of such possible samples is $N!/[(N-n)!n!]$ and,

$$Pr(S_{n,k}) = \frac{(N-n)!n!}{N!}; \quad k = 1, \dots, \frac{N!}{(N-n)!n!}. \quad (1)$$

Another way to characterize a simple random sample is in terms of the inclusion probabilities for individual population units. Let $\{U_h : h = 1, \dots, N\}$ denote the population units. The number of possible samples that contain unit U_h is equal to the number of samples of size $n-1$ that can be formed from the other $N-1$ population units. Then simple random sampling implies that the probability unit U_h is included in a sample of size n , S_n say, is given as the number of possible

samples that contain unit U_h divided by the total number of possible samples,

$$\begin{aligned}
 Pr(U_h \in S_n) &= \frac{\left\{ \frac{(N-1)!}{(N-1-(n-1))! (n-1)!} \right\}}{\left\{ \frac{N!}{(N-n)! n!} \right\}} \\
 &= \frac{(N-1)! (N-n)! n!}{N! (N-n)! (n-1)!} \\
 &= \frac{n}{N}.
 \end{aligned} \tag{2}$$

The probabilities in (1) and (2) are *equivalent*, that is, either characterizes a simple random sample of size n drawn from a population of size N .

Now consider the physical (or computational) process of selecting a random sample. There are several ways in which this may be accomplished. First, the units in a population are arbitrarily ordered with labels $1, \dots, N$. How these labels are assigned is completely irrelevant so long as each unit has a distinct label. A *group* selection procedure then consists of enumeration of each of the possible samples of size n and selecting one of these samples at random. For example, if $N = 6$ and $n = 2$, the possible samples could be enumerated as,

Sample	Unit Composition	Sample	Unit Composition
1	$\{U_1, U_2\}$	9	$\{U_2, U_6\}$
2	$\{U_1, U_3\}$	10	$\{U_3, U_4\}$
3	$\{U_1, U_4\}$	11	$\{U_3, U_5\}$
4	$\{U_1, U_5\}$	12	$\{U_3, U_6\}$
5	$\{U_1, U_6\}$	13	$\{U_4, U_5\}$
6	$\{U_2, U_3\}$	14	$\{U_4, U_6\}$
7	$\{U_2, U_4\}$	15	$\{U_5, U_6\}$
8	$\{U_2, U_5\}$		

A random sample of size 2 would then be selected by choosing one integer from 1 to 15 at random, and the associated sample. By the equivalence of (1) and (2), the probability that a population unit U_h was selected for the sample would be n/N or here $2/6$. This is easily verified numerically for the present example from the number of times each unit appears in the list of 15 possible samples, which is 5; $5/15 = 2/6$.

An alternative procedure by which to select a sample is through the use of sequential sampling. To produce a sample of size n under this procedure, n steps are carried out as follows:

Step	Action
1	Select 1 unit at random from population of size N
2	Select 1 unit at random from remaining population of size $N - 1$
3	Select 1 unit at random from remaining population of size $N - 2$
\vdots	\vdots
n	Select 1 unit at random from remaining population of size $N - (n - 1)$

Consider a particular population unit U_h . Let $E_{1,h}$ denote the event that U_h is selected for the sample in the first step of the sequential procedure. Let $E_{2,h}$ denote the event that U_h is selected in the second step of the procedure, and similarly for $E_{3,h}, \dots, E_{n,h}$. The probability that unit U_h is selected for the sample is the probability of the union of the events $E_{1,h}$ through $E_{n,h}$. That is,

$$Pr(U_h \in S_n) = Pr(E_{1,h} \cup E_{2,h} \cup \dots \cup E_{n,h}).$$

Since the events $E_{1,h}, \dots, E_{n,h}$ are mutually exclusive, the axioms of probability give that,

$$Pr(U_h \in S_n) = \sum_{i=1}^n Pr(E_{i,h}). \quad (3)$$

Now, $Pr(E_{1,h}) = 1/N$ and, for $i = 2, \dots, n$,

$$Pr(E_{i,h}) = Pr(E_{1,h}^c \cap \dots \cap E_{i-1,h}^c) \frac{1}{N - (i - 1)},$$

where $E_{j,h}^c$ denotes the complement of $E_{j,h}$, that is, the event that unit U_h is not selected at step j of the sampling procedure. Independence of the events $E_{j,h}$ implies independence of the events $E_{j,h}^c$ so that,

$$Pr(E_{i,h}) = \left\{ \prod_{j < i} Pr(E_{j,h}^c) \right\} \frac{1}{N - (i - 1)}. \quad (4)$$

We have that $Pr(E_{j,h}^c) = (N - j)/(N - (j - 1))$, and, for $i = 2, \dots, n$,

$$\begin{aligned} Pr(E_{i,h}) &= \left\{ \prod_{j < i} \frac{N - j}{N - (j - 1)} \right\} \frac{1}{N - (i - 1)} \\ &= \frac{1}{N}. \end{aligned} \quad (5)$$

For example, if $i = 5$ and $5 < N$, equation (5) would give

$$\begin{aligned} Pr(E_{5,h}) &= \left\{ \prod_{j < 5} \frac{N - j}{N - (j - 1)} \right\} \frac{1}{N - (5 - 1)} \\ &= \frac{N - 1}{N} \frac{N - 2}{N - 1} \frac{N - 3}{N - 2} \frac{N - 4}{N - 3} \frac{1}{N - 4} \\ &= \frac{1}{N} \end{aligned}$$

Finally, substituting $Pr(E_{1,h}) = 1/N$ and (5) into (3) gives,

$$Pr(U_h \in S_n) = \sum_{i=1}^n \frac{1}{N} = \frac{n}{N}, \quad (6)$$

which, by (2) is the same inclusion probability that would be obtained by the group sampling procedure. Thus, the group procedure and the sequential procedure are equivalent.

The benefits of the sequential procedure are that it is amenable to formulation of computational algorithms for random sampling and that it does not depend on a

fixed sample size n being available prior to formation of the sampling list. It is, in fact, directly analogous to the physical process that one would conduct to draw n numbered balls without replacement from a box containing N such balls. What is, perhaps, less obvious is that this procedure can be used to develop a sampling list of all N units in the population. To obtain a random sample of n units one simply takes the first n units in the list. And, if it is later determined that a sample of size $n + m$ (for non-negative integer m) is desired, one merely adds the next m units from the list into the sample.

The ramification of this for the present problem is that there is no need to determine a necessary original sample size to obtain a given number of responses, under a guess that a certain percentage of the originally sampled units will respond. With a complete sampling list in hand and a desired sample size of 120, say, one would simply sample the first 120 units in the list. If only 100 of those units responded, then the next 20 units would be sampled. If only 15 of those units responded then the next 5 units would be sampled, and so forth, until a total of 120 responses were obtained. This is, of course, only a *sampling plan*. It does not solve the difficulty of how to deal with selected units that result in a nonresponse.

3 Adjustment for Nonresponse

Statistical properties of basic survey sampling estimators are typically derived under the assumption that a response is obtained from every population unit selected for a given sample. This is often not the case, and there are a variety of strategies to deal with the issue of nonresponse in sampled units. The simplest strategy is to ignore nonresponse, using the number of sampled units with response as the sample size n . For example, if a sample of size of 120 was planned, but only 118

of those units responded, one might take the selected sample size to be $n = 118$ and employ the usual formulae derived under the assumption of complete response for sampled units. Alternatively, if a sample of 120 was planned, but only 118 responses were realized, one might employ the sequential sampling plan to extend the sample until 120 responses were obtained and then use $n = 120$ in the usual estimators. Either of these strategies may very well be reasonable in cases for which the number of nonresponses is a small proportion of the sampled units. Formal definition of “reasonable” and “small” are beyond the scope of the present report, but should fall within the range of intuition for our purposes; a basic criterion would be whether estimates derived under an assumption of complete response are meaningfully different from analogous estimates that are adjusted for nonresponse; this is, of course, not known. If the level of nonresponse is more than a small proportion of the planned sample size, however, this strategy is not reliable. For example, if a sample of size 180 was drawn, from which 120 responses were realized, use of the standard estimation formulae using $n = 120$ could not be justified, and would almost certainly lead to more unreliable results than the prescription to re-define the population of interest based on response, which was made in the previous report. Thus, if NMFS is unwilling or unable to re-define the population being sampled, some type of adjustment for nonresponse is necessary.

In the present problem, little is known about either the level of nonresponse that will occur or the potential bias that nonresponse might introduce in estimates of population quantities (e.g., totals or means). There are no magic analytical procedures that can completely resolve this difficulty. To approach this problem in the current situation, it may be helpful to distinguish between what might be called *estimation bias* and *application bias*. These terms are not standard in the statistical literature, but are used here to provide a sense for the different impacts that

nonresponses may have. What is called here estimation bias results from improper handling of what most statisticians call *missing completely at random* or the slightly weaker *ignorable nonresponse*. In the context of estimators proposed in the previous report, estimation bias results from the use of inaccurate inclusion probabilities in formulae for estimation and inference. That is, the probability that a given unit is sampled and provides a response to be used in estimation differs from the probability that the unit is sampled, and use of the latter in estimation may lead to inaccurate results. Such estimation bias may be adjusted for in a relatively straightforward manner.

Application bias presents a much more difficult problem. Application bias occurs if sampled units that result in a nonresponse differ in a systematic manner (with regard to the response of interest) from other units in the sample. Little can be done to alleviate the problem of application bias if nothing is known about the relation between the value of responses and the probability of response or nonresponse. Information on this relation that is useful may be either *direct* or *indirect*. Direct information is sometimes obtained through a process of *double sampling* in which additional efforts are made to obtain responses from a subset of the units that resulted in nonresponse in the original sample. This option does not appear to be feasible in the current situation. Indirect information is available if a relation can be estimated between response value and auxiliary variables. For example, if cost of refrigeration could be related to age of vessel, then it might be possible to *predict* responses for sampled nonresponding units based on vessel age. This is known as *imputation* of missing responses and there are a variety of statistical methods by which such imputation may be accomplished. No information of this type is available in the current situation, for which no responses of any kind have yet been observed, yet alone relations discovered between those responses and any other

variable or variables. Thus, it is highly doubtful that formal imputation procedures hold much promise for dealing with potential application bias in the survey currently being designed. While application bias is a potentially serious problem, there is no evidence that indicates it will be present in a survey of shrimp fishermen. There is, of course, also no evidence that it will not be present. A troublesome aspect of this study is that it appears impossible to obtain direct information about possible relations (or lack thereof) between response values and probability of response. This suggests that the potential problem of application bias in survey nonresponse will be difficult to resolve based on information gathered in the present survey.

The preceding discussion implies that what is called here application bias, which results from non-random missing nonresponse, or non-ignorable nonresponse, cannot be adequately dealt with in the current survey. There appears to be no other choice than to make an assumption of missing completely at random and to take steps to adjust estimators to eliminate estimation bias. This is not terribly difficult for the estimators proposed in the previous report. Those estimators depended on the computation of inclusion probabilities for sampled units, that is, the probability that a given unit (vessel) in the population was chosen for inclusion in the sample. For example, if $\{y_i : i = 1, \dots, N\}$ are the values of a response of interest for units in a population of size N , and if $\pi_i = Pr(\text{unit } i \text{ is chosen for inclusion in the sample})$, then an estimate of the population total for the response is

$$\hat{\tau}_y = \sum_{i \in \mathcal{S}} \pi_i^{-1} y_i, \quad (7)$$

where \mathcal{S} denotes a sample of size n . Equation (7) is the basic *Horvitz-Thompson* estimator of a population total, and forms the basis for many of the derived estimators proposed in the previous report. In (7) the inverse of the *inclusion probabilities* π_i are weights for estimation of the population total. One way in which this can be understood is to consider the following. If every unit in the population were observed,

the actual population total could be computed using $\pi_i = 1$ for all $i = 1, \dots, N$. If $1/2$ of the units in the population were observed at random, then $\pi_i = 1/2$ for all i , and each unit in the sample would “represent” two units in the population. Similarly, if $1/10$ of the population were randomly sampled, each unit included in the sample would represent 10 units in the population. Now, if a given unit is included in the sample with probability $1/20$ while another unit in the sample is included with probability $1/5$, then the first represents 20 units in the population, while the second represents 5 units in the population.

Under an assumption of missing at random, estimation bias can be eliminated through an adjustment of the inclusion probabilities used in estimation. That is, the weighting scheme described above is adjusted according to the probability that a sampled unit results in a usable response. For example, if a group of population units have probability of inclusion in the sample of $1/5$, but the probability of a response from those sampled units is only $1/3$, then the probability that one of those units contributes a usable response in estimation of the population total is $1/15$. Thus, the sampled units for which responses are observed now represent 15 units in the population, rather than the original 5 units that would have resulted if all sampled units provided a response. Mathematically, this results in an adjustment of the estimator (7) to the form

$$\hat{\tau}_y = \sum_{i \in \mathcal{S}} (\pi_i p_i)^{-1} y_i, \quad (8)$$

where p_i represents the probability that a sampled unit results in a usable response, or the conditional probability of response given selection for the sample.

The difficulty with the estimator (8) is that the conditional probabilities of response given selection for the sample (i.e., the p_i) are not known, and are not produced through the sampling plan, as are the inclusion probabilities π_i . Thus,

they must be estimated from sample data, resulting in the estimator

$$\hat{\tau}_y = \sum_{i \in \mathcal{S}} (\pi_i \hat{p}_i)^{-1} y_i. \quad (9)$$

The estimated response probabilities \hat{p}_i in equation (9) may be taken as the proportion of sampled units that respond within a given subclass of the sample, often called *weighting classes*. For example, these values might be produced as the proportion of units within a sampling strata that provide usable responses. Or, they might be calculated as the proportion of sampled units within one of the strata in a post-stratification scheme that provide responses. Alternatively, they might be estimated based on a logistic regression of the probability of response against any number of potential auxiliary variables, possibly followed by grouping or “coarsening” of the results into classes of which all members receive equal weight. The most appropriate form of estimation for the (conditional) response probabilities cannot be selected prior to examination of data that result from the initial survey. Also, while the point estimators presented in the previous report are easily modified as illustrated above (i.e., use of $\pi_i \hat{p}_i$ rather than π_i alone), variance formulae are more greatly affected. This is because estimation of the p_i as \hat{p}_i introduces an additional source of variability into the estimation procedure. Attempts can be made to incorporate this additional uncertainty into estimated variances through various approximations, such as the Taylor series expansions employed in the previous report. In general, adjustments such as described above are most useful in situations for which nonresponse bias is expected to constitute a larger problem than the increase in uncertainty caused by the need to estimate response probabilities.

It is worthy of repeated emphasis that the type of *weighting adjustment* described immediately above is meant to deal with potential estimation bias under an assumption of missing at random or ignorable missingness. It is not meant to deal with application bias that results from nonresponses that differ in a systematic fashion

from responses. At the same time, it is superior to the naive approach of drawing a "larger than anticipated" sample, with subsequent analysis pretending that the realized sample size involved complete response (e.g., Little and Rubin, 2002).

References

Little, R.J.A. and Rubin, D.B. (2002), *Statistical Analysis with Missing Data* 2nd ed., New York: Wiley.

Magnuson-Stevens Fishery Conservation and Management Act

Public Law 94-265

As amended through October 11, 1996

SEC. 303. CONTENTS OF FISHERY MANAGEMENT PLANS 16 U.S.C. 1853

95-354, 99-659, 101-627, 104-297

(a) REQUIRED PROVISIONS.--Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, shall--

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are--

(A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery;

(B) described in this subsection or subsection (b), or both; and

(C) consistent with the national standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

(4) assess and specify--

(A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3),

(B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing, and

(C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on--

(A) participants in the fisheries and fishing communities affected by the plan or amendment; and

(B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority--

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided;

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors; and

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

97-453, 99-659, 101-627, 102-251, 104-297

(b) DISCRETIONARY PROVISIONS.--Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may--

(1) require a permit to be obtained from, and fees to be paid to, the Secretary, with respect to--

(A) any fishing vessel of the United States fishing, or wishing to fish, in the exclusive economic zone [or special areas,]* or for anadromous species or Continental Shelf fishery resources beyond such zone [or areas]*;

(B) the operator of any such vessel; or

(C) any United States fish processor who first receives fish that are subject to the plan;

(2) designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear;

(3) establish specified limitations which are necessary and appropriate for the conservation and management of the fishery on the--

(A) catch of fish (based on area, species, size, number, weight, sex, bycatch, total biomass, or other factors);

(B) sale of fish caught during commercial, recreational, or charter fishing, consistent with any applicable Federal and State safety and quality requirements; and

(C) transshipment or transportation of fish or fish products under permits issued pursuant to section 204;

(4) prohibit, limit, condition, or require the use of specified types and quantities of fishing gear, fishing vessels, or equipment for such vessels, including devices which may be required to facilitate enforcement of the provisions of this Act;

(5) incorporate (consistent with the national standards, the other provisions of this Act, and any other applicable law) the relevant fishery conservation and management measures of the coastal States nearest to the fishery;

(6) establish a limited access system for the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account--

- (A) present participation in the fishery,
- (B) historical fishing practices in, and dependence on, the fishery,
- (C) the economics of the fishery,
- (D) the capability of fishing vessels used in the fishery to engage in other fisheries,
- (E) the cultural and social framework relevant to the fishery and any affected fishing communities, and
- (F) any other relevant considerations;

(7) require fish processors who first receive fish that are subject to the plan to submit data (other than economic data) which are necessary for the conservation and management of the fishery;

(8) require that one or more observers be carried on board a vessel of the United States engaged in fishing for species that are subject to the plan, for the purpose of collecting data necessary for the conservation and management of the fishery; except that such a vessel shall not be required to carry an observer on board if the facilities of the vessel for the quartering of an observer, or for carrying out observer functions, are so inadequate or unsafe that the health or safety of the observer or the safe operation of the vessel would be jeopardized;

(9) assess and specify the effect which the conservation and management measures of the plan will have on the stocks of naturally spawning anadromous fish in the region;

(10) include, consistent with the other provisions of this Act, conservation and management measures that provide harvest incentives for participants within each gear group to employ fishing practices that result in lower levels of bycatch or in lower levels of the mortality of bycatch;

(11) reserve a portion of the allowable biological catch of the fishery for use in scientific research; and

(12) prescribe such other measures, requirements, or conditions and restrictions as are determined to be necessary and appropriate for the conservation and management of the fishery.

97-453, 104-297

(c) PROPOSED REGULATIONS.--Proposed regulations which the Council deems necessary or appropriate for the purposes of--

(1) implementing a fishery management plan or plan amendment shall be submitted to the Secretary simultaneously with the plan or amendment under section 304; and

(2) making modifications to regulations implementing a fishery management plan or plan amendment may be submitted to the Secretary at any time after the plan or amendment is approved under section 304.

Reasons: The foreign instrument provides suitability for studying the smaller eyes of animal rather than human subjects by allowing (1) use of a stereotaxic apparatus for head stabilization, (2) higher in-depth and transverse resolutions and (3) the option of sequential sampling. The National Institutes of Health advises in its memorandum of April 28, 2003 that (1) these capabilities are pertinent to the applicant's intended purpose and (2) it knows of no domestic instrument or apparatus of equivalent scientific value to the foreign instrument for the applicant's intended use.

We know of no other instrument or apparatus of equivalent scientific value to the foreign instrument which is being manufactured in the United States.

Gerald A. Zerdy,

Program Manager, Statutory Import Programs Staff.

[FR Doc. 03-14778 Filed 6-10-03; 8:45 am]

BILLING CODE 3510-DS-P

DEPARTMENT OF COMMERCE

International Trade Administration

University of California, San Diego; Notice of Decision on Application for Duty-Free Entry of Scientific Instrument

This decision is made pursuant to Section 6(c) of the Educational, Scientific, and Cultural Materials Importation Act of 1966 (Pub. L. 89-651, 80 Stat. 897; 15 CFR part 301). Related records can be viewed between 8:30 a.m. and 5 p.m. in Suite 4100W, U.S. Department of Commerce, Franklin Court Building, 1099 14th Street, NW., Washington, DC.

Docket Number: 03-017.

Applicant: University of California, San Diego, La Jolla, CA 92093-0658.

Instrument: Laser Capture Microdissection System.

Manufacturer: Molecular Machines & Industries AG, Switzerland.

Intended Use: See notice at 68 FR 23978, May 6, 2003.

Comments: None received.

Decision: Approved. No instrument of equivalent scientific value to the foreign instrument, for such purposes as it is intended to be used, is being manufactured in the United States.

Reasons: The foreign instrument provides: (1) Minimal damage to cellular structures during laser microdissection of small tissue samples and (2) superior optics due to the optical geometry of the operating arrangement. The National Institutes of Health advises in its memorandum of

April 28, 2003 that (1) these capabilities are pertinent to the applicant's intended purpose and (2) it knows of no domestic instrument or apparatus of equivalent scientific value to the foreign instrument for the applicant's intended use.

We know of no other instrument or apparatus of equivalent scientific value to the foreign instrument which is being manufactured in the United States.

Gerald A. Zerdy,

Program Manager, Statutory Import Programs Staff.

[FR Doc. 03-14779 Filed 6-10-03; 8:45 am]

BILLING CODE 3510-DS-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 060603B]

Proposed Information Collection; Comment Request; Gulf of Mexico Shrimp Economic Data Collection

AGENCY: National Oceanic and Atmospheric Administration (NOAA).

ACTION: Notice.

SUMMARY: The Department of Commerce, as part of its continuing effort to reduce paperwork and respondent burden, invites the general public and other Federal agencies to take this opportunity to comment on proposed and/or continuing information collections, as required by the Paperwork Reduction Act of 1995, Public Law 104-13 (44 U.S.C. 3506(c)(2)(A)).

DATES: Written comments must be submitted on or before August 11, 2003.

ADDRESSES: Direct all written comments to Diana Hynek, Departmental Paperwork Clearance Officer, Department of Commerce, Room 6625, 14th and Constitution Avenue, NW, Washington, DC 20230 (or via the Internet at dHynek@doc.gov).

FOR FURTHER INFORMATION CONTACT: Requests for additional information or copies of the information collection instrument and instructions should be directed to Michael Travis at 727-570-5335 or at Mike.Travis@noaa.gov.

SUPPLEMENTARY INFORMATION:

I. Abstract

NOAA proposes to collect information on fishing vessel expenses and earnings on a voluntary and continuous basis in the Gulf of Mexico offshore shrimp fishery. The information will be used to conduct

socioeconomic analyses that will improve fishery management in that fishery. It will be used in conjunction with catch and effort data already being collected in this fishery as part of federal and state dealer reporting programs, as well as Coast Guard and federal and state fishing permit data on vessel characteristics, to assess how fishermen will be impacted by and respond to any regulation likely to be considered by fishery managers. In addition, this data will be used to determine how fishing communities will be impacted by proposed fishing regulations.

II. Method of Collection

The information will be collected through interviews.

III. Data

OMB Number: 0648-0476.

Form Number: None.

Type of Review: Regular submission.

Affected Public: Business or other for-profit organizations; and individuals or households.

Estimated Number of Respondents: 500.

Estimated Time Per Response: 67 minutes.

Estimated Total Annual Burden Hours: 558.

Estimated Total Annual Cost to Public: \$0.

IV. Request for Comments

Comments are invited on: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden (including hours and cost) of the proposed collection of information; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques or other forms of information technology.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of this information collection; they also will become a matter of public record.

Dated: June 4, 2003.

Gwellnar Banks,

Management Analyst, Office of the Chief Information Officer.

[FR Doc. 03-14796 Filed 6-10-03; 8:45 am]

BILLING CODE 3510-22-S